DEC 1 2 1944

FOOD INDUSTRIES

● FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

uction device recovers
lbumen from egg shells

DECEMBER 1944

Modern Trends In Plant Sanitation

Controlling Quality Of Raw Materials

Saw-Tooth Roof Improved Two Ways

Lye-Peeling Method Pays off for Simplot

Pointers on Making Better Cream Cheese

Data on Mandarin And Tangerine Oils

Facts and Fancies Of Airfreight Cost

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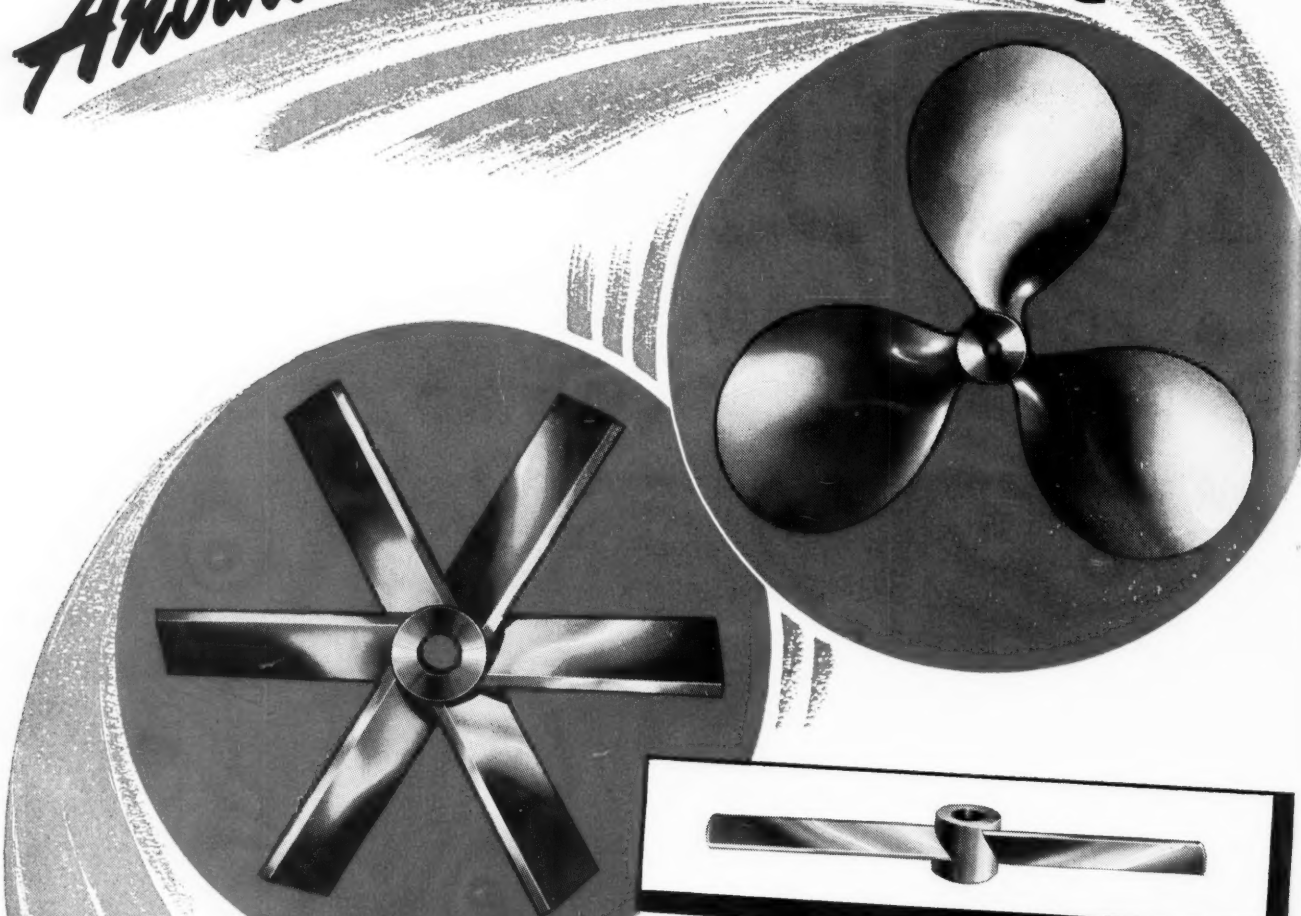

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Library

TECHNOLOGY

FREEZING
Blanched Blueberries 151

DAIRY PRODUCTS
Cheese Sediment 151
Control Tests 151
Cream Cheese Suffers if Sanitation Slips 74

STARCH
High-viscosity Starch 151

NUTRITION
Canned Foods 152

DEHYDRATION
Toughening of Dry Fish.....152
Eggs 152
Beet Blanching Methods Evaluated..... 86
Improved Technics for Making Gas-Pack Tests 92
New Facts About Packaging and Storing Dehydrated Food—Part XI.... 94

SANITATION
Dairy Germicides 153
Trends in Plant Sanitation..... 76

FATS & OILS
Volume Changes in Fats Indicate Structure 154

QUALITY CONTROL
How to Get Farmers to Grow Good Crops for Processing..... 69

PRODUCTION
Lye Peeling Pays Off..... 72
Convenient Chart for Vintners..... 85

ENGINEERING
Better Saw-Tooth Roof Design Developed by Aussie Canner..... 78

FLAVORING
Mandarin and Tangerine Oils..... 82

THE COVER

Waste of material in egg breaking plants is prevented by the suction device shown on the cover. The operator places each half shell on this device, waits a moment for the suction to remove the albumen adhering to the shell, then presses a lever which permits the shell to fall into a receptacle. The albumen goes into a glass container suspended from the bottom of the machine. (USDA Photo by Forsythe.)

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Vol. 16, No. 12

DECEMBER, 1944

SPECIAL FEATURES
No Food Surplus for Long Time.....*By L. V. Burton* 67
How To Get Farmers To Grow Good Crops for Processing 69

PRODUCTION
Lye Peeling Pays Off.....*By Ray L. Dunlap* 72
Canning Sea Mussels..... 80
Convenient Chart for Vintners..... 85

QUALITY CONTROL
Cream Cheese Suffers If Sanitation Slips *By Theodore Marcus* 74
Trends in Plant Sanitation.....*By Andrew J. Krog* 76

PRODUCTS
Foods with Future from Yams..... 75

ENGINEERING
Better Saw-Tooth Roof Design Developed by Aussie Canner.....*By R. Gordon Edgell* 78

MATERIALS
Mandarin and Tangerine Oils.....*By Ernest Guenther* 82

RESEARCH
Beet Blanching Methods Evaluated *By Herbert S. Madsen, Earl Litwiller and E. H. Wiegand* 86

DISTRIBUTION
New Menu in England.....*By Martin Gotz* 87
How To Take Care of Synthetic Tires..... 88
Report Tailspins Airfreight Costs.....*By J. A. J. Jones* 90
Utilization of Nutrients in Milk.....*By Earle O. Whittier* 91

DEHYDRATION
Improved Technics for Making Gas-Pack Tests *By C. C. Strachan & J. J. Embree* 92
New Facts About Packaging and Storing Dehydrated Foods—Part XI...*By Research Staff, Continental Can Co.* 94

EVERY MONTH

Editorials .....67 and 97
Talk of the Industry..... 68
Automotive 88
New Packages and Products.....100
Food Industry News.....105
Indicators 114
Government Orders 116
Capital Views 118
Men, Jobs and Companies.....121
Food Equipment News.....131
Catalogs and Bulletins.....139
Books 140
Patents 143
Food Technology—Abstracts.....151
Questions and Answers.....155
Formulas 157

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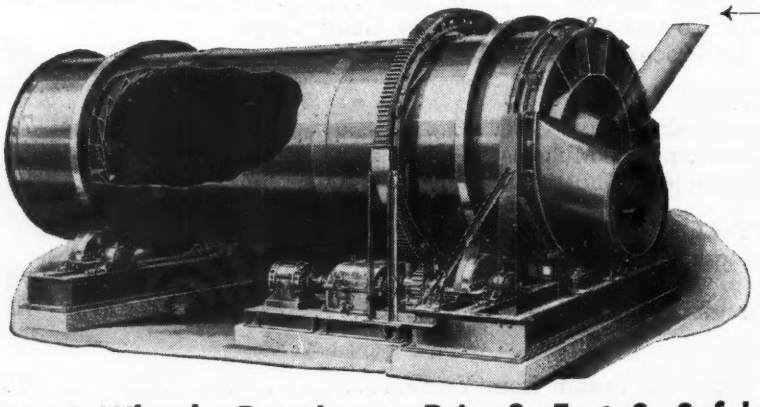

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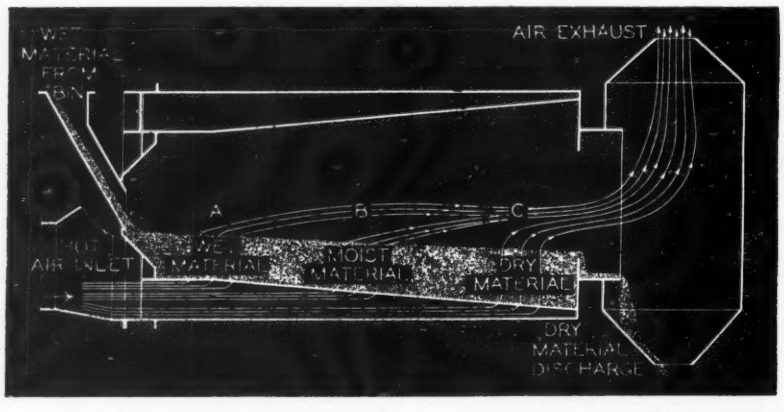

A
Large heat passages send a large volume of hot gases through a thin layer of wet material.

B
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THE FAR EAST

Frontier for American Enterprise

IN THE great tradition of America, our frontier lies to the West. But for a United States that stretches from the Atlantic to the Pacific, to Go West is to arrive in the Far East. The feet of literally millions of our young men are now set upon that route.

Accomplishment of their objective—the defeat of Japan—will not end our responsibilities to the Orient any more than the defeat of Germany will end our responsibilities to Europe. This time we mean to see the venture through.

The first sketch of a political program for enlisting the strength of nations of good will to enforce the peace was drawn at Dumbarton Oaks. That is a good start. But those who participated know how much work remains before the blueprint becomes a fully matured plan, the plan becomes a structure, and the structure takes life and effective being in the living imagination and will of the peoples of the world.

No political accord, however high its purpose, can endure for long if it depends upon the loyalty and support of populations embittered by hopeless poverty that is offered no promise of relief. The poisonous dust of mass despair makes inevitable an ultimate explosion, whether it be sparked by a torch supplied from without or by its own internally generated heat. Much of the Far East is sufficiently close to that position to pose a grave problem to the Western world. It is of particular importance that American business men and workers alike recognize the nature of their responsibility in the matter, for to them the great area of the East presents also an opportunity and a challenge.

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The Orient—stretching in a vast semicircle from Manchuria and Japan to India and Ceylon—is the home of more than a billion people, the world's greatest potential market. In its mountains are the earth's richest stores of tin and mica; its deposits of iron ore, coal, and manganese rival those of France, Russia, and the United States. Its rice paddies are the most productive in the world, its coconut and rubber plantations the largest, and its cotton production is of major volume.

And yet, this fabulous region—with its riches of manpower and raw materials—suffers from living standards at the lowest rung of the world scale. With as much as 85 per cent of the populations of this great area devoted to the production of farm products, starvation has been an endemic plague to countless millions of its inhabitants, and will remain so until they graduate from the crudely primitive methods of the crooked stick and the bamboo plow to the use of the implements of a modern world in both agriculture and industry.

The improvement of agricultural methods and the burgeoning of industrial development depends upon tools—a preponderance of simple tools, no doubt, at the beginning, for modernization of economic processes is a development that cannot be forced at a rate faster than the ideas upon which they depend can be developed. If we, in the United States, are to hope to supply a major portion of the implements upon which the salvation of the East depends, we must be prepared to export also the skills and technologies which will make their effective use possible.

The possibility of a world market for machinery and manufactured products is a challenge that American industry cannot afford to ignore. The United States will emerge from the war with almost half of the world's industrial capacity within its borders, with much more than half of the heavy industries. Drastic and painful readjustments are inevitable; but they can be mitigated to the extent that we can find outside markets for the products for which we have excess capacity.

We shall find ourselves, at war's end, in a singularly favored position to compete in any equipment markets which are open. It is not merely that we shall have the productive capacities crying for outlets. Aside from Germany and Japan, which for some time will not be in a position to compete, our two major industrial Allies, Great Britain and Russia, will face enormous tasks in providing for their own rehabilitation. Neither of them is likely to be in a position to export more capital than they absorb; and although Canada, Sweden, and Switzerland will be, the United States will stand alone as the one major creditor nation in the world. If the potential advantages of this position are managed with wisdom and imagination, they will enormously enhance our opportunities for supplying a great share of the capital goods demand of undeveloped areas.

☆ ☆ ☆

What is the dimension of the Far East's potential demand? What are some of the difficulties standing in the way of its being realized?

If needs were the only measuring stick, the Far Eastern market would provide a bottomless pit into which even the great stores of our exportable capacity could be poured with room to spare.

China, alone, with its teeming population of 450 millions, has spelled out needs in dimensions large enough to stir the imaginations of the equipment producers of the world.

Business Week (February 5, 1944) supplements Dr. Sun Yat-Sen's spacious first estimates of the requirements for a thorough-going industrialization program with figures provided by current Chinese planners—25,000 locomotives; 300,000 freight cars; 20,000 passenger coaches; 20,000,000 tons of steel; and 90,000 power driven machine tools for the first five years of reconstruction. An American manufacturer of farm equipment, who recently surveyed the agricultural requirements of China, estimates an ultimate Chinese market for 20,000,000 tractors.

India's drawing-board plans are equally expansive. According to the bold pattern drawn up by a group of Bombay industrialists—some of whom are due to visit the United States early in 1945—India, after the war, will require a capital investment of $2,000,000,000 a year over the next 15 years, of which $250,000,000 per year for the first seven years will be in the form of imported capital goods.

Included on the huge import order list of the Bombay executives are mining, roadbuilding and power station equipment, heavy locomotives, metallurgical plants, agricultural machinery, and a long list of machine tools.

There can be no question of the need of these countries for the industrial equipment—and for many items of manufactured goods—which we are so eminently in a position to supply. But realism requires that we measure this demand against the Far East's probable capacity in the relatively near future to absorb industrial goods.

A Chinese economist has estimated that China, in 1937, had a total industrial capital investment of about $1,000,000,000 in American values, or something like $2.50 per capita of population. In contrast, the American investment, in manufacturing facilities alone, is now more than $600 per capita.

What it could mean in terms of capital goods requirements if China alone carries out this dream of modernizing, not to the utopian level of the United States but to the present modest level of the less developed Soviet Union, is typified by measuring just three lines: 500,000 tons of steel a

year, for five years, to add 12,500 miles to the railroad system; 2,187,500 motor vehicles; 3,300,000 telephones.

But it is one thing to cite mountainous figures demonstrating needs. It is another, and far less optimistic exercise, to find assurance that practical opportunities for satisfying such needs can be made to materialize. Let us face some of the major difficulties and see if they are insurmountable.

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The first hurdle to be cleared is the question of whether or not we want to promote the industrialization of the Far East. The wisdom of doing so has been vigorously challenged. The negative argument, on the economic side, generally runs thus: If we provide industrial equipment to backward economic areas, we deprive ourselves of the greater long-run opportunity of selling them manufactured articles which our aid has enabled them to produce for themselves.

It is only fair to say that such a thing might happen—that it has happened in isolated instances in the past. But the overwhelming weight of economic history demonstrates that the broader attitude is also the profitable one.

The United States itself is the living refutation of the fear which now cramps the outlook of many of its own citizens.

From 1790 until 1850 the foreign trade of our new fledged Nation had many of the characteristics which pertain to the trades of China and India today. We imported manufactures and we exported raw materials, agricultural products, and newly mined gold. Our imports exceeded exports, the difference being made up partly by payments to us for shipping services and partly by industrial development loans. It is relevant to inquire how the trade of the lenders was affected by this policy of supplying us with industrial capital and machinery.

From 1850 through 1939 the pattern of America's foreign trade changed. Slowly at first, and then at accelerated pace, our import ledger showed a percentage decline in manufactured goods and a percentage rise in raw materials to feed our expanding industrial facilities. But while finished manufactures declined percentagewise in our import budget, so great was the increase in our total foreign trade operations in the century from 1830 to 1930 that our imports of manufactured goods increased more than twentyfold, and they more than doubled between 1900 and 1939.

Clearly industrial Europe gained rather than suffered from the industrialization of the United States, and it is equally clear that we, in turn, shall benefit from the industrialization of the world's undeveloped territories. Further evidence is provided by Canada which, with its high industrial development but only 12 million people, buys from us each year almost as much as the relatively unindustrialized 130 million people south of the Rio Grande.

If it be granted, as I believe it must, that the development of Far Eastern countries will be to our advantage as well as theirs, the second question that we should face is the speed with which it can be accomplished. Is there genuine promise in the proximate future of opportunities for American enterprise of the magnitude set forth in the estimates quoted above?

In all fairness, I am forced to state my conviction that the road is longer than is indicated by Chinese and Indian leaders. It is natural, and far from censurable, that their eyes should be focussed upon the urgency of national needs, rather than upon obstacles in the way of their fulfillment.

On the other hand, it is possible that our own long process of industrialization may lead us to conclusions of undue conservatism. Ideas, once they break the crust of resistance are the most contagious of bacteria, and the tempo of their infiltration seems to increase by geometrical progression in a world of swift communication.

☆ ☆ ☆

In an interesting recent study of The International Labor Office, it is suggested that the general economic level of the rest of Asia outside Japan in the late 1930's was not dissimilar to that of Japan in 1900. Between 1900 and 1936, Japan increased its total capital investment more than threefold devoting between 10 and 17 per cent of its annual income to capital outlays. A comparable tempo of development for China, India, and other Asiatic areas would result in a capital expansion that would dwarf to insignificance the most optimistic blueprints that have been put forth to date. I am not suggesting this as a likely possibility, but rather as a caution lest we, in the name of hard-headed realism, underestimate Asiatic potentials as much as their own nationals exaggerate them.

Finally, in appraising the outlook for American enterprise in Far Eastern markets, we collide, head-on, with the problem of how we are to be paid. Here, hard-headedness can be only a virtue, for the lack of it will breed inevitable disaster for the Asiatics as well as for us.

In the last analysis, the dimension of the American market in the Far Eastern countries will be determined by the dollar exchange at their command, obtained through the products, goods, and services which they are able to provide to us, with due allowance for multilateral trade arrangements. It is true that the balance temporarily can be distorted through the extension of developmental loans. There is little question but that such loans will be in order after the war, and if they are wisely made, for productive projects that eventually will increase the exporting capacities of the countries to which they are extended, they can be thoroughly justified. But the best loans provide only a temporary expedient. In the long run, the balance of current payments must be restored with sufficient margin to provide interest payments and finally amortization of principal.

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How, then, are we to attack the problem of increasing our imports from the Orient?

In 1937, the total exports of the Far East amounted to something over $5,000,000,000—a little less than $1,500,000,000 in foodstuffs, a little more than $2,500,000,000 in raw and partly manufactured materials, and better than $1,000,000,000 of manufactured articles. Of this total, the United States purchased only about 20 per cent—approximately 10 per cent each of the foodstuffs and manufactures, and 30 per cent of the materials.

Despite changes in our technologies which will probably reduce our future takings of such important items as rubber and silk, the achievement of a high level of economic activity in this country after the war will provide a basis for increasing our Eastern imports, but only if it is an accepted part of our national policy to do so.

This means an alert and aggressive exploration of two-way trade possibilities on the part of both American business and our governmental agencies. It cannot be done by either alone.

The war has dislocated many of the trade patterns that prevailed in the past. The East is hungry for the type of products which we, uniquely, are situated to supply, but it will make its bargains with those who will not only fill its needs but will also provide outlets for its produce. Even the prewar magnitude of the exports from this area provides ample margin for the most meticulous and imaginative shopping of Eastern markets with the aim of increasing the modest share of our prewar purchases. And a farsighted program of development loans can greatly increase the capacity of these countries to produce what we want.

In general, we can trust American enterprise to explore rigorously all likely export opportunities. But the equally vigorous investigation of import possibilities will require a break from past traditions on the part of American business and American government.

Both East and West must learn to think in new patterns for the successful opening of a new frontier.

President McGraw-Hill Publishing Co., Inc.

No Food Surplus for Long Time

SOME of the most significant news of the day for the food industry comes from Australia. That nation is suffering a drought of calamitous proportions. Only the droughts of 1902 and 1914 equal it in area and shortage of rainfall. Chiefly affected is the southeastern region, where the highest concentration of sheep and wheat raising is to be found.

As long ago as May, 1944, there had been a prolonged dry spell when I visited the stricken region. At that time I heard all manner of complaints regarding lack of rainfall and saw the vast expanse of dried out pasture land, so white that in the distance it resembled snow. Station owners (sheep ranchers) even then were unable to provide fodder or buy it. That was more than a half-year ago. Today it has become important news for the United States, for the drought has not been broken, and the food-producing ability of Australia is rapidly declining.

Wheat production in Australia is expected to be less than half of last year's 100,000,000-bu. crop. But because of the 80,000,000-bu. carryover, the seed situation will not become acute. Sheep, however, are being sent to slaughter houses because of the fodder shortage, and the exportable surplus of lamb carcasses can be expected to be cut in two, with the further prospect that the loss of breeding stock will require about six years to recoup. Present estimates indicate the loss of about 1,500,000 ewes from this cause.

The past dependence of American Armed Forces on Australia for food supply, as well as Britain's dependence on food imports from the Dominions, makes the drought losses very important in our own forward thinking. The only reason the United States Forces have depended on Australia for subsistence has been to conserve shipping, for there was a time two years ago when the choice lay between men and food. Ships were that scarce.

Shipping space is somewhat more plentiful today, but our demands for food in SWPA and the Philippines are increasing as we send more men to those areas. It is not necessary to await a pronouncement from our government—if one is not "fact-blind"—to realize that all the talk about food surpluses in the recent past has been based on rather limited views of the world situation. If one can but see a few moves ahead, it should be very clear that the United States must continue to export increasing amounts of food, both raw and processed, for some time to come.

Britain's place and problems in the world food picture is also a compelling force in the same direction. Many of the Australian meat packing houses are British owned and operated. Their original purpose has been to supply Britain with food imports. Only insistence by the Australian government has directed a substantial proportion of their output to the U. S. armed forces. But after several years of such diversion of food from the customary outlets in Britain to our armed forces, and with Britain still very short of food, the pressure for resumption of normal meat exports has gradually forced a revision of the general plan of allocation. Also, United States curtailment of Lend-Lease donations is not without some bearing on the matter.

A further factor in the world food situation is Britain's four-year food plan, which is intimately a part of the complex economy of the British Empire and Britain's effort to cope with its enormous war debt and greatly reduced foreign trade. By an announcement in Parliament in June, the British Minister of Food told of the purchase of all surplus beef, mutton and lamb from Australia and New Zealand until June, 1948. Canada is to supply nearly 2,000,000,000 lb. of bacon through 1946. And all exportable sugar from the Colonies and Dominions up to 1947 is to go to Britain. All this spells one thing for the United States: We are soon to face the problem of supplying practically all our food for our own military forces, and can place less dependence on nearby Allied sources.

Add to the foregoing, the fact that Lt. Col. Ralph W. Olmstead, deputy War Food Administrator, has returned from Russia and reported that the food situation there "is unbelievably difficult" and that Russia will need to import food from the United States for three years after V-E Day. Furthermore, he said that Russia will take every bit of food for which ships are available, and could use ten times as much if there were ships to carry it. He also confirms the British need to import food at current levels, either from the United States or the British Dominions.

China's needs for food also are enormous. But because there is no present way to deliver food to that invaded nation, this future demand is not a part of the current discussion.

Any one who deals with the broader aspects of the world food problem, and refuses to get tangled up with the minor problems of localized maldistribution, can easily see that the job for the American farmer and food processor is increasing, not decreasing.

There will be changes in emphasis, changes in volume of this or that food, but the total demand for processed and unprocessed food cannot be materially reduced for another year or two. I repeat what, in various ways, I have often said before: When the shooting stops, that's when the food problem will begin to reach its maximum.

L. V. Burton EDITOR

The Talk of the Industry

• THE paper shortage should be well known to all by now, but every few days we receive requests for back copies of FOOD INDUSTRIES. The plain cold fact is that there are no extra back copies. If you give away your current copy, or throw it away and next day recall something you want to see again, you will not be able to replace the missing copy.

Another cold fact is that nearly all magazines, this one included, have waiting lists of those who wish to become paid subscribers. If your subscription lapses, your renewal is put on the waiting list and there is no way to get the missing copies.

• How far is it to the Philippines from the normal source of supply of munitions and subsistence for our armed forces? The distance is measured in thousands of miles. But to state that a place is 9,000 miles away does not always measure the route to be traveled. Nor does it enable one to visualize the distance. The difficulty in the latter case is that most of us know more about travel eastward than we know about westward journeys.

Any attempts to visualize global distances must be done on a globe. From San Francisco to Leyte in the Philippines is as far as a great circle from New York to Baluchistan in northwest India. From Hobart, Tasmania, to Leyte is as far as a trip from New York to Cairo, Egypt. If you took either of the trips from New York you would think you were traveling some distance, yet on a map the places never seem so far apart when they are on the opposite side of the earth from where you live.

This little mental exercise is important because much of the food for our military forces must traverse just that distance. It will take ships, ships and still more ships.

• GRADE LABELING came in for a going over at a recent meeting held in New York under the auspices of the Textile Section of the New York Board of Trade. There was much discomfiture because nearly all the discussion was about food labels, whereas it had been planned to have the discussion around textile labels.

As nearly as we can summarize the current status of the discussion of this perennial subject, it comes down to this: graded descriptive labels *vs.* ungraded descriptive labels. Proponents of consumer grades are now so enamoured of the idea that they will not relinquish the description once they have heard of it. Time was when *A, B* or *C* would have been sufficient.

Annual Index

IF you bind your annual volumes of FOOD INDUSTRIES, you will want the annual index and title page. A limited number of these is available, on request. The index does not appear in this issue, because of the paper shortage.

• A SMART baking firm has adopted an unusual idea to locate a capable sales manager. The company has put out a finely printed brochure telling all about the job and encloses an application form, asking the recipient to pass it along to the chap who might be interested.

All of this recalls the chap who "stole" the research director from a very prominent food company without ever once mentioning salary to him. "As a matter of fact," remarked the president of the new firm, "I have only now discovered that the research director is now working for less money than he was getting before. How did I do it? I *sold* him the job. You know very well that it takes more than money to get a man to change jobs. Up to $5,000 a year, money talks. After that, it takes something else."

Hors d'Oeuvres

• Japan has a "wonderful" new food: "The mold from rotting wood is planted in sawdust. Later a little starch is added and the mass steamed a while. After fermenting, the product is dried in the sun."—The worms from the rotting wood probably are saved for Hirohito.

• *You've had a bad year. But next summer you may enjoy your leisure. Victory gardening will not be something without which you cannot live with your conscience. 'Twill, in fact, be the other way around. With the prospect of food surpluses developing, WFA has come to realize that flowers are much prettier than vegetables.*

• OPA has taken rhubarb out of the fruit classification and put it on the vegetable list. Well, if the New Deal agencies don't get their mistakes corrected it won't be because they don't have enough time.

• *In the Soviet polar settlements around Yan River, Verkhoyansk, the average temperature is 16 below zero. Yet the Russians have successfully grown vegetables there. But then the Russians are masters at making things hot in cold climates.*

• Tree Fruits, Ltd., British Columbia, is experimenting with a new wrinkle in food storage. Cull apples—200 tons of them—have been placed in a fish net and submerged in Lake Okanagan.—First we store food in caves, then under water. What's next, bins hung from sky hooks?

• *It has been discovered that propionic bacteria added to Swiss cheese culture not only produces "eyes" without the use of undue heat but also prevents the formation of brown spots and discoloration around the eyes. Apparently the Swiss have known more about holes than they have told.*

• Some 320 tons of government-held prunes recently spoiled while awaiting a buyer. But WFA claims that since Lend-Lease started, food losses through spoilage have amounted to only $1 out of $5,000 worth handled. With that record, messing up a few carloads of prunes hardly makes WFA a Pruneface.

• *Studies with mice have shown that the younger the animal the lower its susceptibility to alcohol. The two-year olds didn't do so well, they being the age equivalent of 80-year old people. When one goes on a spree and gets frisky like a two-year old filly, he is likely to end up next morning feeling like a two-year old mouse.*

• A medical authority has stated that only 15 percent of the drug store vitamins purchased by consumers does any good. And one might justly consider as wasted the part of that 15 percent taken by old men to give them young ideas they can't live up to. F.K.L.

Mobile grower-relations office, where farmers and members of Ritter's field staff meet informally to talk over mutual problems

How To Get Farmers To Grow Good Crops for Processing

As Told to "Food Industries" by Those in Charge of Raw Material Quality at P. J. Ritter Co., Bridgeton, N. J.

Ritter has developed methods by which it controls the quality of tomatoes grown by local farmers. The technic starts with research on an experimental farm and extends through scientific agriculture to good will building

CLOSE control of raw-material quality can be maintained by the food processor who obtains his supply entirely from local farmers. It is not necessary for the processor to own land nor to farm leased land. Methods for effecting such control have been worked out by P. J. Ritter Co., Bridgeton,, N. J., and those methods, as applied to tomatoes, are discussed here.

We at Ritter's know that we are not farmers. We do maintain, however, that we know tomatoes and tomato quality better than the farmers do. Through many years of experience, we have developed controls over the seed, the testing of the seed and the planting and raising of the young plants. We have worked out methods of conditioning the soil for the type and quality of tomato desired. Our experts can judge the quality of a field of tomatoes and make recommendations which will produce the maximum yield. But Ritter wants no part of farming.

Producing the Seed

We are interested in two varieties of tomatoes, Marglobe and Rutgers, approximately 80 percent of the tomatoes processed at our plant in Bridgeton being Rutgers. Through seed cultivation, we have developed modified types of these two varieties. We pay a premium of approximately 5 percent for tomatoes grown from our seed in fields certified by the State at the end of the growing season.

We maintain both an experimental breeding farm and a seed plant. The plant breeding farm performs several functions. Each year seeds from every known variety of tomato, and from every seed producing house, are planted on this farm. And the tomatoes grown are tested for quality against those produced from certified Ritter seeds. The experimental farm also is used as a test ground for fertilizers and insecticides. We test both manufactured and natural fertilizers.

This experimental farm also is the place where the seeds are developed for Southern planting. It takes three years to produce this seed. About fifty plants are grown the first year from selected seed. Then the seed from the best hundred plants in the lot is planted the following year in plots. The harvest from these, after any undesirable plants have been eliminated, provides the seed for planting 15 to 20 acres the third year. Seed from the third harvest is used for Southern planting the following year.

The experimental farm also is used for cross breeding and other experimental work to improve the varieties, or to produce hybrids with improved qualities.

Although the Southern plants are grown in Georgia, we maintain a certain degree of control. The seed is delivered personally by our plant breeding expert, who also picks the plots on which the plants are to be raised. Two plots are selected, one on elevated dry land, the other in low moist land. This is insurance against the weather. The planting on one plot will meet our needs in event that excessively dry or wet weather causes a total loss of plants on the other plot.

Our plant experts maintain a few other controls over the Southern

planting. We specify the kind and amount of fertilizer to be used before planting, or at any time after planting if additional soil enrichment is required. Our representatives not only specify the exact hour for pulling the plants, but they supervise their packing for shipment to Bridgeton. And the plants are prepared against disease, or the propagation of any disease, under the supervision of our men.

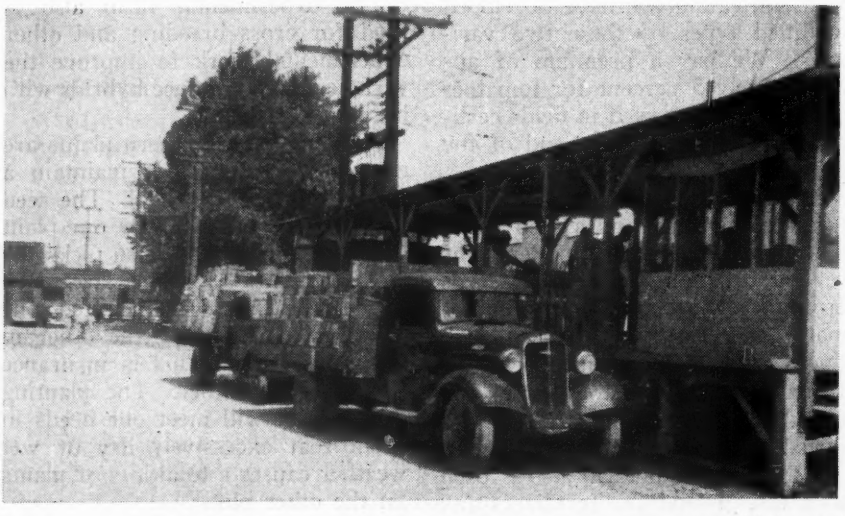
Speaking of plant disease, it is worth noting that Anthracnose, or "blossom rot," can be controlled by plowing in a mulch of swamp grass around the roots of the tomato vine.

Southern vs. Home-Grown Plants

Sometimes the planting date in New Jersey is delayed when the plants are raised in the South. But when cold weather causes Southern plants to be late, those grown in the North usually are late, too, because of slow growth in the cold frames. Even though the Southern plants are relatively small, they overtake the New Jersey plants, and in our experience the final yield is always as good or better.

Whether our contract farmers plant Southern plants or New Jersey plants, the controls are the same. On all our contract acreage the plants come from the same seeds, a soil analysis is made, proper fertilization is administered, and the plants are properly cultivated. We consider, therefore, that we have a fair check on the relative yield from the Southern and the New Jersey plants. We are certain that if there is any difference, it is in the favor of the former.

Scheduling farmers' trucks prevents congestion in the plant yard, such as that as shown here, and saves the farmers hours of waiting.



Trucks arrive at the inspector's dock at Ritter's according to a time schedule, clearing rapidly without traffic congestion and with a minimum of time lost through waiting.

We also have checks on Southern plants started in the open vs. hothouse and frame plants. We prefer the former.

Whether the plants come from the South or from New Jersey, they should, if possible, be planted not later than May 6.

The fall season in New Jersey sometimes is very unfavorable to tomatoes. Successive rains may prevent picking or knock down the plants so that the tomatoes rot on the ground. Or other conditions may make the end of the season unprofitable for harvesting. For that reason, both we and the farmers agree that a maximum yield during a short season is by far the best.

A few farmers gamble on the weather and attempt to raise an early tomato crop for market use, followed by a crop for the cannery. This is about the only case of staggered planting. Both Ritter and the farmer would prefer to receive all of the plants on May 6 and get them into the ground as soon as possible. Our interest is in top-grade tomatoes only, and at the end of the season the quality of the crop falls off rapidly.

Control at the Farm

We maintain a large staff of men in our procurement department. These men visit contract farmers and prospects regularly, both before and during the growing season. They follow the development of the crops closely, reporting to the company and giving advice to the farmers. It is also their job to create and maintain good will for the company among contract farmers and prospects.

Preplanting Procedure

After a contract has been signed and the land specified, samples of soil are taken for analysis. On the basis of this analysis and the crops to be planted the following year, we specify the kind and amount of fertilizer and the type of application. The cost of fertilizer frequently is borne by the company until the time of annual settlement.

It is seldom that farmers do not carry out exactly the fertilizing recommendations we give to them, as experience has proved that the increased yield more than justifies the cost. If a farmer does persist in ignoring our advice, he is refused subsequent contracts.

One reason for the ready ac-

ceptance of our advice on fertilizer is the fact that we insist on fields that can be certified by the State inspector. We pay approximately 5 percent more for tomatoes from certified fields, which bonus may represent a good portion of the farmer's profits. Also, we pay on the basis of State grading, and the proper application of fertilizer produces a top-price grade, as well as a higher yield.

Experience also has taught the farmer that close planting increases the difficulty of weeding and cultivating and reduces the total yield per acre. Most tomato farmers in this part of New Jersey use 4x4-ft. spacing, which permits cross-row weeding and cultivation, although a few use 3x5-ft. spacing. Spacing greater than 4x4 ft. may not greatly increase yield, but closer planting will reduce the yield.

Control During Cultivation

After the plants are in the ground in New Jersey, Ritter men check regularly on every field. Frequent visits are made to farms which are not progressing satisfactorily, and the farmers are urged to cultivate and plow under the weeds or to apply insecticides where insects or disease is making headway. Rarely does the farmer fail to follow the advice of the field man.

A final control comes at the time of harvest. It involves the scheduling of loads at the State inspector's dock. This is a control which attempts to conserve the farmer's time. When the farmer brings in his first load of the season, a time schedule is worked out for each succeeding load—whether it be one load a day or many. And the farmer knows that if he arrives on schedule, he will clear the plant with no unnecessary waiting—that if he is behind time, he may have a long wait and lose many precious hours.

Control of Next Year's Seed

Individual production lines are maintained for each variety of tomato processed. And "no seed" tomatoes are processed separately from certified tomatoes, regardless of the end product. The "no seed" tomatoes may be those produced from our plants in fields which were so neglected that the tomatoes could not be certified. Or they may be from farms not under contract, where a number of varieties of tomatoes may have been planted. In normal years, we depend entirely on tomatoes grown on contract farms from plants started from our seed. In years of partial crop failure, however, tomatoes from other acreages are bought.

The separate production lines for the "no seed" tomatoes end where the seeds are removed. After that, the juice or pulp may be processed into any end product, depending upon production requirements at the time. The seeds, however, are passed through a process where the "meat" is fermented off, then through washing sluices, an extractor and a dryer.

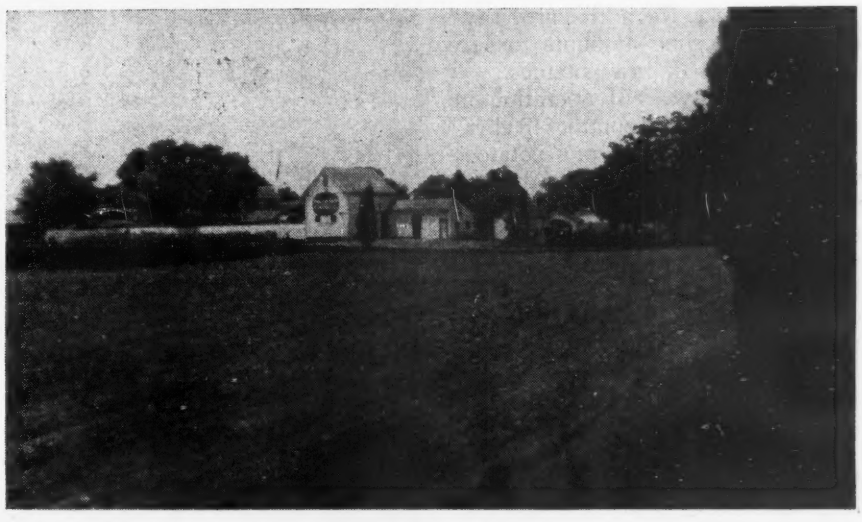
Meetings with Farmers

We attempt to tie our whole control program together through many informal meetings with small groups of farmers and members of the field staff. During these meetings, means and methods and mutual problems are discussed. Uncertain farmers often are influenced by the opinions of other farmers in the group. Not only do better methods result from these meetings, but company-farmer relations are improved. Part of this program is carried out in a trailer fitted out as a lounge, where soft drinks, snacks and smokes are served.

Farmer Education

Our experimental farm also is used for educational purposes. Farmers in groups are shown the advantages gained from scientific methods. They see the results obtained from practically every different type and variety of seed, as well as the effect of fertilization, time of planting, proper weeding and many other factors, including the use of automatic planting machines.

Our experience convinces us that adequate quality control over raw material can be maintained if the whole-hearted cooperation of the farmers is secured.



Ritter's experimental farm.

The laboratory at Ritter's is important in the quality control of raw materials.

LYE PEELING PAYS OFF

Simplot cuts peeling loss 100 million pounds in year; produces 4 lb. more of product per manhour than average for industry. Operation somewhat different from usual method

By RAY L. DUNLAP, Chemist, J. R. Simplot Dehydrating Co., Caldwell, Idaho.

IN one year's operations, 100 million pounds of potatoes was saved through lye peeling at J. R. Simplot Dehydrating Co., Caldwell, Idaho. Last year the company produced 20 million pounds of dehydrated potatoes from 160 million pounds of the raw vegetable. Had abrasive peelers been used, 260 million pounds of raw potatoes would have been required. With a contract this year for 25 million pounds of the dehydrated product, the anticipated saving by lye peeling amounts to 125 million pounds of raw potatoes.

In the first year of operation in which we peeled the potatoes in abrasive peelers, 13 lb. of raw potatoes was used for every pound of dry potatoes produced. Since changing over to lye peeling in April, 1943, the yield has increased until only 7.9 lb. of raw potatoes is required for one pound of the dehydrated product. This is an increase of nearly 5 lb. of dehydrated potatoes per 100-lb. bag of raw potatoes used, or a gain of 65 percent.

The saving is not only in the material which otherwise would have been lost, but also in labor, because of the increase in yield with little or no increase in the manhours required. For the same labor cost, there was an increase of 65 percent in production. This achievement was confirmed by Army officials in the statement that "Simplot produces 4 lb. more of finished product

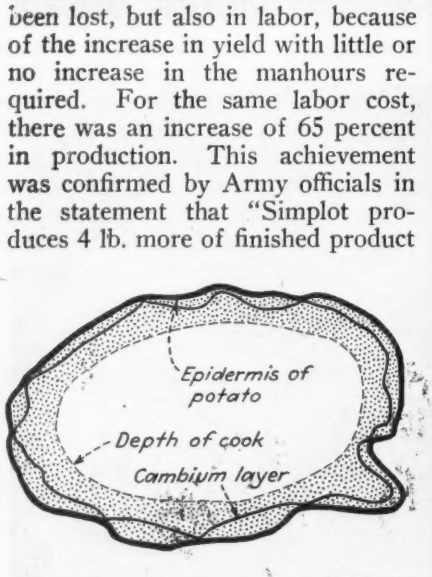


FIG. 2. Cross section of potato, showing depth of precook, which is just sufficient to inactivate peroxidase enzyme under epidermis.

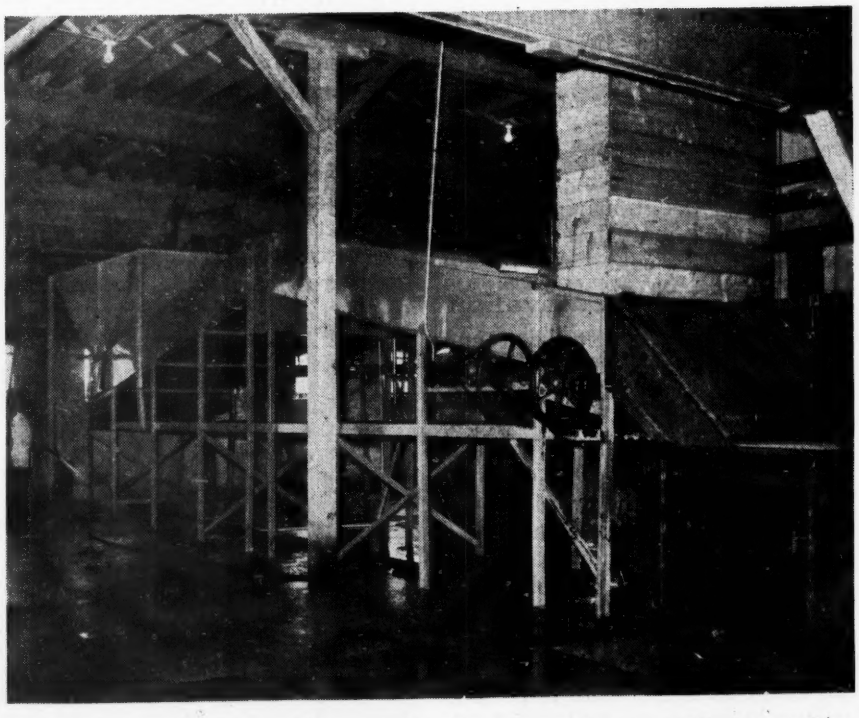


FIG. 1. Precooker used in Simplot plant, which has resulted in more satisfactory peeling.

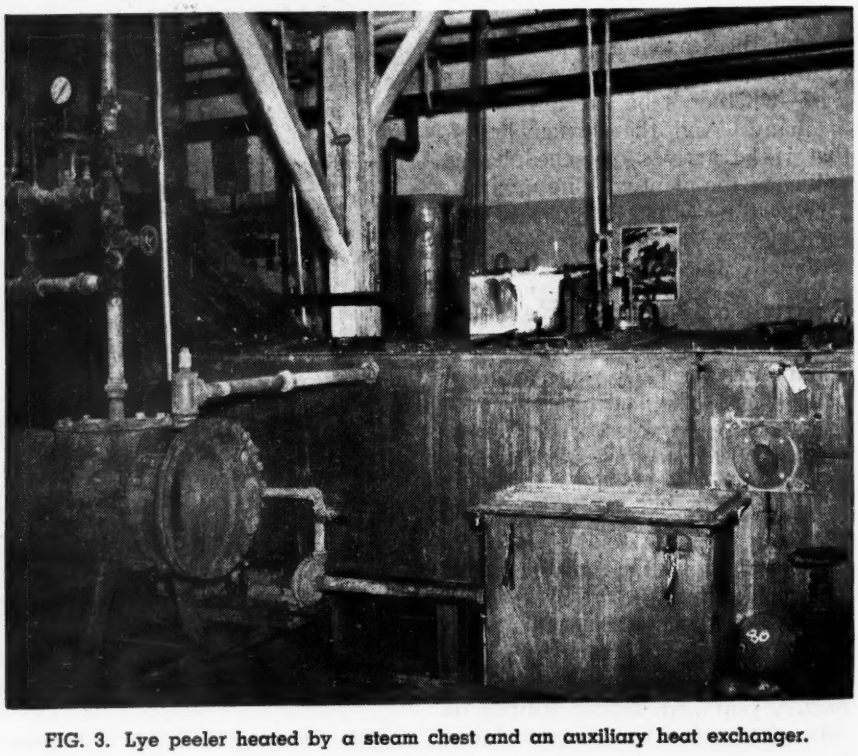


FIG. 3. Lye peeler heated by a steam chest and an auxiliary heat exchanger.

FIG. 6. Potatoes going to trimming tables after being lye-peeled.

per manhour than the average of all other dehydrators."*

The manpower problem is a big factor in the operation of a plant of our size. We are operating our lye-peeling equipment with two men per shift, peeling an average of 12 tons per hour. If we were to use steam peelers, it would require ten men per shift to obtain satisfactory capacity, and we then would have ten machines to keep up. It would also require a larger trimming crew, as we have observed that the peel is not as completely removed by steam peelers as by a good lye-peeling operation.

The laboratory of the Simplot Co., under the direction of Ray L. Dunlap, chemist, started experiments in January, 1943, on lye peeling methods. The observations made were followed very closely when the installation of equipment was made in April, and our lye peeling operation is somewhat different from the usual method.

The original equipment consisted of a Pasadena washer converted to a water precooker, an old helical peach peeler, a Muir barrel washer and a Paramount brush washer. The barrel washer and the Paramount washer are standard equipment in most of the potato warehouses of Idaho, and they are proving satisfactory for removing the lye-disintegrated tissue of the potato.

After some experimentation, we

*Fortune, July, 1944.

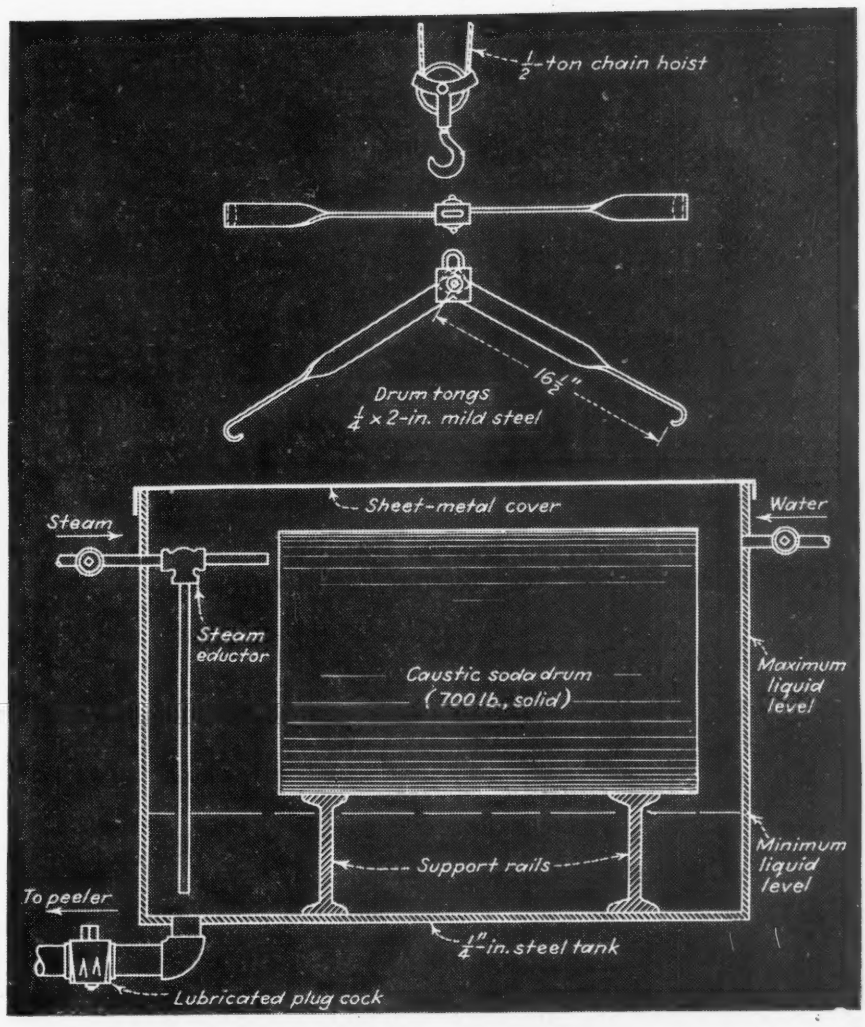


FIG. 4. Tank in which solid caustic is dissolved with live steam and water. As the peeling operation demands additional caustic, this solution is added from the tank. Hoist and tongs for handling heavy drum of caustic are shown.

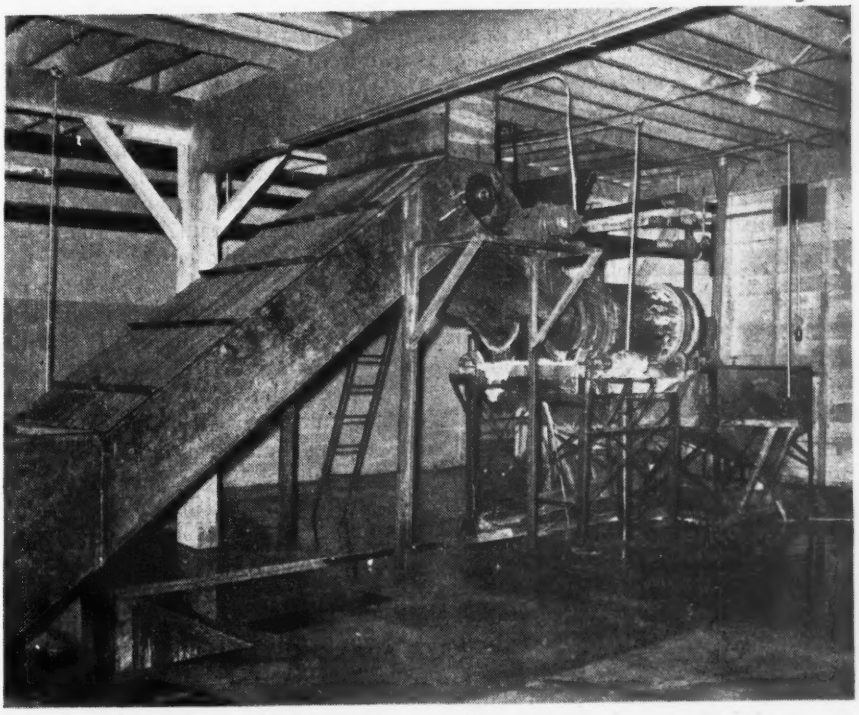


FIG. 5. After leaving the lye peeler, the potatoes pass through two barrel washers and two brush washers.

decided to remove the Pasadena washer converted for use as a water precooker and replace it with a continuous steam precooker very similar to a humpback blancher (Fig. 1). This resulted in much more satisfactory peeling, and at the present the continuous steam precooker is in use in our plant.

The old peach peeler had been replaced by a lye peeler designed by the engineering staff and constructed in the company shops. Today it is functioning very successfully.

Successful lye peeling in the Simplot plant depends on the precook, which not only facilitates re-

(*Turn to page* 147)

Cream Cheese Suffers If Sanitation Slips

By THEODORE MARCUS,
Massachusetts Dairy Laboratories, Roxbury, Mass.

Laboratory control and good sanitary practices in the plant add appreciably to the keeping quality of cream cheese and help to overcome a serious fault of that food

CREAM CHEESE, America's contribution to the cheese world, suffers from a serious lack of keeping quality. Some of the trouble arises from causes which are inherent in the cheese itself. Being uncured, it is perishable and must be refrigerated at each and every stage in its manufacture and distribution. But most of the trouble is due to inadequate control and insufficient attention to sanitation during manufacture.

How Cheese Is Made

In the process of cheese making, 18 percent sweet cream, with or without 0.1 to 0.2 percent of locust bean flour, is pasteurized at 160 to 180 deg. F. for 30 minutes. The mix is cooled to 120 to 140 deg. F. and homogenized at 3,500 lb., then cooled to 72 to 75 deg. F.

The cooled homogenized cream is drawn into a coil vat where a 1 percent lactic culture is added with thorough agitation. Fermentation is allowed to proceed for 12 to 14 hours. After 0.7 to 0.8 percent titratable acidity has been reached, the curd is broken by rotating the coil. One to 2 percent salt is added and the soured mix is heated slowly to 120 to 140 deg. F. and cooled immediately to below 50 deg. F.

The cheese is drawn into bags and each bag is tied with string. These bags are placed on wooden racks in an ice chest to drain. They should be reversed and repiled daily to facilitate drainage during the two or three days which are required to reach the proper condition.

The cheese usually is packed in special paper-lined boxes by a worm-fed packing machine with a wooden block.

During the pasteurization and homogenization, and until the cream is in the coil vat ready for the culture, standard dairy machinery and practices are used. Pasteurization of the cream at 160 to 180 deg. F. should eliminate nearly all bacteria and all yeasts and molds, in order to provide a good base for the cheese making. The control on the preparation of the cream is the bacteria count on the mix before the lactic culture is added. Good sanitary procedure should give a standard plate count here of under 1,000 with no yeasts or molds.

Volumes have been written about lactic cultures. It is impossibe to be too particular about the quality of the culture. Vitality, however, is more important than flavor and aroma.

The acidity reached and the salt added, provided that it is a good grade of butter salt, should add nothing to the keeping problem but should improve the keeping quality of the final cheese.

The slow heating to 120 to 140 deg. F. will kill some of the bacteria present at this point, but the holding time is short and the treatment is not adequate to eliminate any considerable contamination in the product.

Precautions Required

Cotton bags and strings have contaminated untold volumes of cheese. The bags and strings must be washed properly. And immediately before use, they should be immersed in water at 180 to 200 deg. F. for 30 minutes. A sterilized metal pan should be used under the bags. The common arrangement of filling them on the floor is a definite invitation to trouble. To prevent contamination in handling, the bags should be transported to the ice chest in a sterilized metal tank.

The wooden racks in the ice chest must be sterilized. For this, immersion in water at 180 to 200 deg. F. for an hour is adequate. The walls, floor and ceiling should be washed periodically with chlorine solution. Clean clothes and clean hands for the men handling the bags will help.

The packing machine should be so built that it can be cleaned and sterilized with hot water or chlorine solution whenever necessary. The wooden block that comes in contact with the cheese *must* be immersed in hot water.

Test Finished Cheese

A final check on keeping quality can be made by taking a Breed smear of the finished cheese to determine yeast and mold counts. The smear is made with a stiff needle from the outside of the cheese. Smears should be as thin as possible. After drying, stain with Newman Lampert II. Well-made cheese will show no yeasts or molds. Three or four yeasts per field (factor 400,000) will cause no appreciable trouble. But higher yeast counts and the presence of mold are indicative of poor keeping quality, with decided off flavors.

Other types of contamination may occur. One defect caused by bacterial action is the development of a bitter flavor. It has been suggested that *Claustridium butyricum* is the causative organism in this case.[1] However, the sanitary measures which will control yeasts and molds will control this type of contamination.

Reference

1. Warren, Journal of Dairy Science, vol. 9, 351, 1926.

Foods with Future from Yams

New and original products made by processing sweet potatoes in different ways have been developed at Alabama Polytechnic Institute. Have postwar possibilities

SWEET POTATO products as manufactured in the newly installed pilot plant at the Alabama Experiment Station, Auburn, Ala., already have attracted the attention of some of the country's leading food manufacturers and marketing establishments. A limited, although widespread distribution of the several products is now being effected and customer reactions are being studied.

The products include baked, extruded and toasted sweet potato, straight and in combination with other ingredients. These products are ready for the customer without further preparation.

These new Alayam (Alabama yam) products are not to be confused with dehydrated sweet potatoes. They are fully prepared and are ready to serve. They represent seven different classes of foods: breakfast foods similar to prepared cereals; natural taffes and combinations with pecans, peanuts, orange peel and coconut; candies; specialty products; and a malt powder.

These are the first and only fully prepared breakfast foods not made from some grain or cereal. They are sweetened by the natural sugars of the sweet potato, and are served with cream. While sugar may be added, Alayam breakfast foods are sweet enough to satisfy most people's tastes. The taffe and combination confections may be used at teas, bridge parties, dinners, or used as snacks. Included in the package group is a variety box similar to fancy candies, which would be very suitable as a gift, or as a sample box. The powder, Alamalt, comes in glass jars. It is used for malted milk shake drinks and for hot drinks at soda fountains or at home.

The products come in several different types of containers, such as cartons, cellophane bags, glass jars and boxes.

Processing Methods

The manufacture of the products in the Station's experimental pilot plant involves several steps; namely, washing and baking, peeling, pulping and mixing, extruding, toasting and packaging.

The graded, cured potatoes are machine washed, emptying onto perforated metal trays on a traveling belt. The trays of washed potatoes are then loaded into rolling racks, which go into a large gas-fired, forced-air baking oven. The baking process is rather exacting, the object being to convert a large portion of the starch to sugars, and to ease peeling and pulping. This requires careful regulation of temperature, humidity and time. Overbaking results in burned outer surfaces of the potatoes and loss of material, and underbaking results in lower conversion of starch to sugars. With proper baking the skins separate from the potatoes and may be removed readily. Improper baking makes skin removal difficult and increases the labor cost and peeling losses.

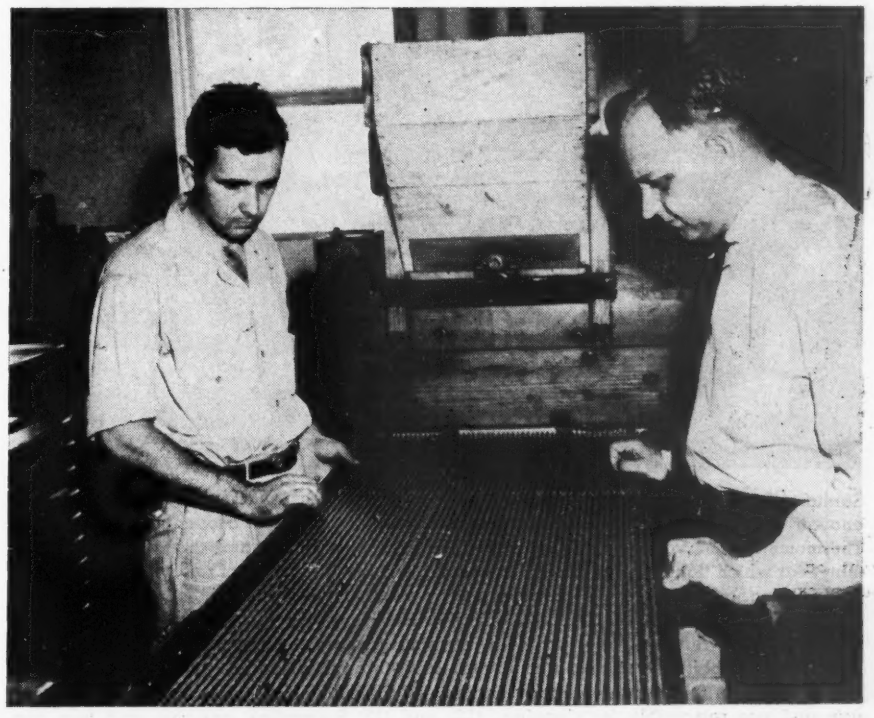
While hand peeling is used at present in the experimental plant, Prof. L. M. Ware is at work on a steam-pressure process for peeling to eliminate much of this hand work.

After peeling, the potatoes are put through a mechanical pulper. In the case where combination confections are to be made, such ingredients as peanuts, pecans, ground orange peel and finely chopped coconut are added and the puree mixture is then beaten to an even consistency in a power mixing machine.

The well-mixed, thick puree is put into the extruder hopper, and the pulp is forced out through small pencil-size holes onto enamel baking trays moving under the extruder nozzle on a traveling belt. The multiple-hole nozzle is similar in principle to a cake decorator, but multiplied many times. Several nozzles are used, each having differently shaped holes to produce certain types of the products.

The trays of extruded puree are then placed in racks, which are rolled into a large gas-fired toasting oven. The heat is maintained at a specified temperature, and it is circulated by a large blower fan which alternately reverses the direction of the hot air. The time of toasting varies with the type of products being toasted. For instance, overtoasting produces a caramel-like flavor for the Alamalt product.

(*Turn to page* 146)



Hubert Harris and L. M. Ware inspect output of experimental extruder, built on the job.

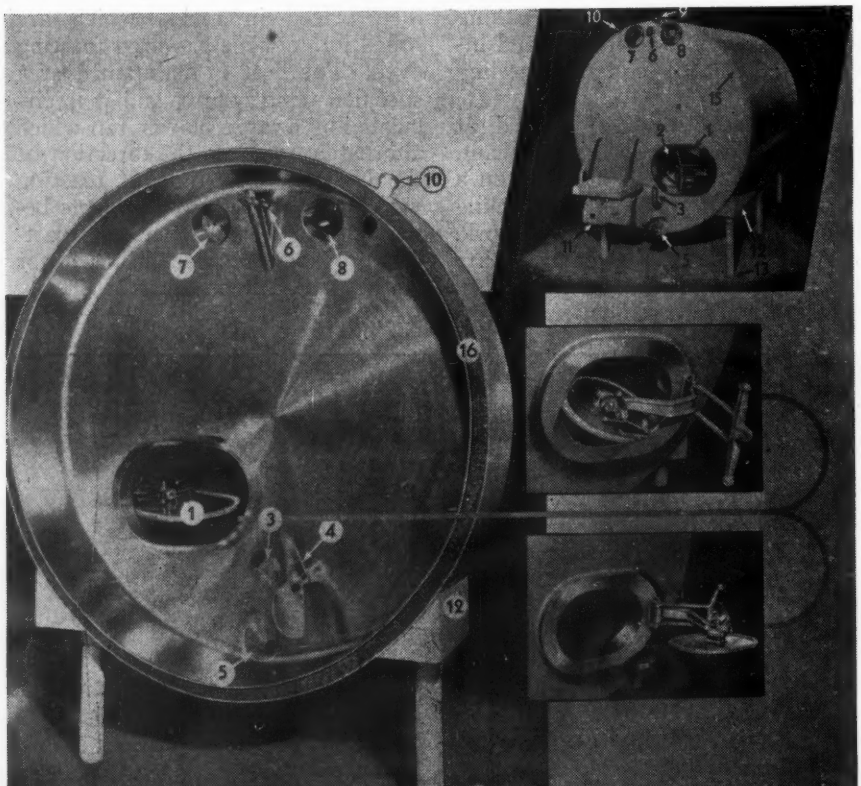
Trends in Plant Sanitation

Close attention to sanitation in all of its many aspects has become a must for progressive processors. Here a health officer explains why and gives practical pointers on building and equipment design and employee cleanliness

By ANDREW J. KROG, Health Officer, Plainfield, N. J.

SINCE the adoption of the present Federal Food, Drug and Cosmetic Act in 1938, and the subsequent enactment of similar legislation by various states, the entire picture of sanitation in food plants has been viewed with a different aspect by Federal, state and local control officials. Formerly, the inspector was chiefly concerned with the obviously apparent unsanitary conditions, such as old accumulations of food products or ingredients in or upon equipment, dirty floors, walls and ceilings, the methods of storing food products or their component parts with respect to refrigeration and possibilities of contamination by insects, rodents and other forms of filth.

The important aspect of technically guarding health sanitation in foods has, within the past few years, been given new significance. The changes in inspection technics and plant requirements have been revolutionary throughout the entire field of the food processing and distribution industry. The remarkable development evidenced during the last 25 years in the sanitary methods of handling and processing milk, ice cream and allied products may be cited as an example of what can, and will be, expected from other food industries.



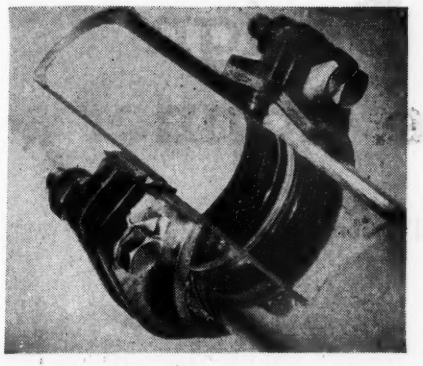
Sanitary features incorporated in modern food processing tanks: (1) Manhole is large enough to permit entry for cleaning, and all parts of cover are accessible. (3) and (10) Thermometer and volume gage connections have sanitary external threads and ground joint seat which tightly seals off inside wall of tank. (4) Agitator is of rotary-seal type without packing and has oilless bearings. All surfaces are accessible for easy cleaning. (5) Outlet valve is flanged to tank through a short, permanent sanitary joint, making it unnecessary to remove valve body for cleaning purposes. Plug of valve is removable, permitting swabbing, vertically and horizontally, through valve and outlet. (6) Inlet is of sanitary design and removable for cleaning. (7) Peep holes are sloped for perfect drainage and are removable for cleaning. (12) and (13) Supporting members and legs are high enough to permit easy cleaning of floor underneath. Legs have ball feet.

Control Now Scientific

In spotting unsanitary conditions, the inspector in the past depended upon his visual acuity and keenness of smell, and upon his ability to feel deposits of slime or other filth in hidden portions of equipment. The men now employed in this capacity by the official agencies are trained technologists, dependent upon the microscope, the laboratory, the sample container and other scientific methods and equipment in their endeavors to assist the food industries to produce more wholesome and better products from the sanitary and nutrition standpoints. They are constantly on the alert for insidious forms of contamination, such as bacteria, molds, rodent and insect filth, metallic or other forms of dangerous adulterants and other factors that are not readily apparent but which affect the safety or wholesomeness of the product.

It is a regrettable fact that at the present time the methods of manufacture and handling of foods in many establishments in the United States are frequently carried out under conditions which are conducive to the contribution of filth and other forms of dangerous contamination to foods.

Unfortunately, this condition is due in great part to the inability of food plant operators to obtain satisfactory new equipment because of wartime restrictions, to the difficulties experienced in employing and holding properly trained personnel and to the changes that have taken place in the various methods of processing and preserving foods.



Standard type sanitary flange and smooth rubber gasket for connecting glass fittings. Note the tight seat on the resilient gasket, minimizing the possibility of accumulation of deposit in crevices and seams.

As a result of the favorable progress of the war effort, it seems reasonable to believe that new equipment and materials for plant-construction purposes soon will be available without restrictions. And food plant operators, architects and equipment engineers planning new equipment or structures, should seriously consider the present-day trends in sanitary methods of construction.

Building Construction

The building, in general, should be adequately lighted, well ventilated and spacious enough so that sufficient "elbow" room will be available for equipment and personnel. All window frames, sashes and doors should be of metal or be metal covered. Toilets, washrooms, miscellaneous store rooms and rooms used for receiving garbage, offal and other byproducts not intended for human consumption ought to be adequately closed off or separated from the parts of the building where food processing or packaging is actually carried on.

Food plant floors must be impervious to moisture and constructed of materials that are rugged enough to carry the type of traffic they must bear without cracking and chipping. They also must be resistant to the corrosive action of the various acids usually associated with food processing, such as glacial acetic acid and others used in cleaning solutions, phosphoric, acetic, tartaric or citric acid solutions and other weak acids found in fruit and vegetable products. Alkalies, too, are an important factor in floor deterioration. Among these may be considered various strong cleaning compounds composed of caustic soda or potash and all other allied products highly alkaline in nature, as well as weak solutions of carbonates, bicarbonates and phosphates. All corners and junctions between walls and floors should be rounded to facilitate cleaning. Attention must be given to satisfactory slopes leading to sufficient drains connected to bell-trapped drainage systems in order that proper washing and flushing can be carried out.

The walls should be of impervious material and resistant to the same destructive agents as the floors, to a point above the maximum splash height. They ought to be smooth and of material that can be cleansed readily. Ceilings should be composed of easily cleaned material which will not absorb condensation. Ledges, flues, window sills, duct openings, and so forth, should be beveled in such a manner as to prevent their use for the storage of tools and seldom-used articles, and to prevent the accumulation of dirt.

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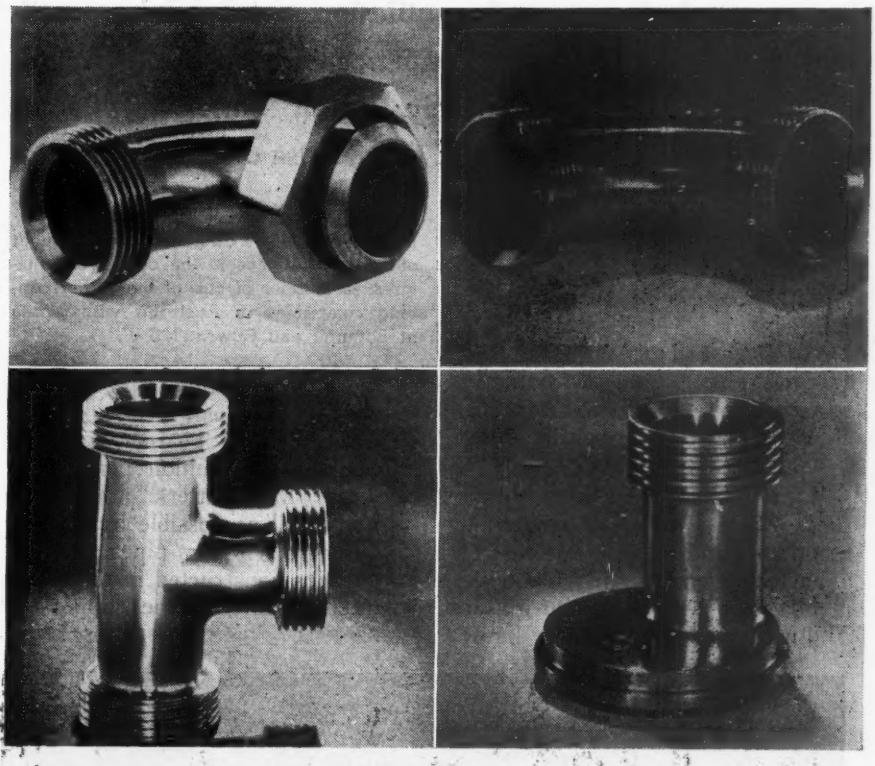
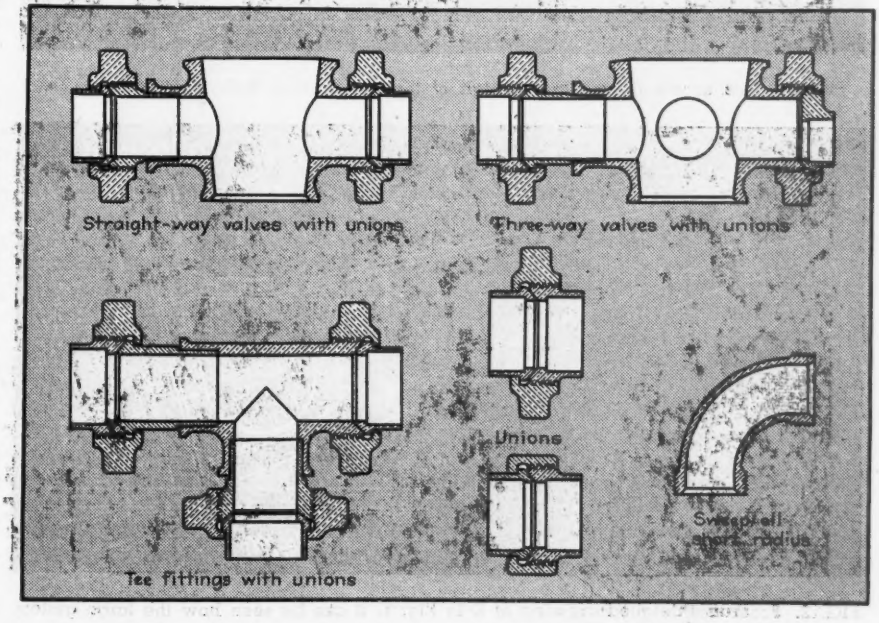


Various types of approved fittings for metal piping, with cross sections (below) to demonstrate sanitary design. Top left: Elbow, 90-deg. sweep, one end threaded, other with union connection. Top right: Elbow, 90-deg. sweep, both ends threaded. Bottom left: Tee, all connections threaded. Bottom right: Reducing ferrule for close hookups.



Cross sections of different type of approved fittings for sanitary metal piping.

Better Saw-Tooth Roof Design Developed by Aussie Canner

By R. GORDON EDGELL, Chairman of Directors, Gordon Edgell & Sons, Ltd., Bathurst, New South Wales, Australia.

Improved drainage and ventilation obtained by modifications in construction. Snub-nose truss permits installation of deep, high-capacity drain gutter. Deflector provides induced ventilation regardless of wind direction

TWO improvements have been made in the saw-tooth roof—a standard feature of all the factory buildings of Gordon Edgell & Sons. These changes have improved roof drainage and facilitated ventilation so as to get rid of the steam arising from the various processing operations of a canning factory.

Roof drainage from saw-tooth roofs always has been something less than satisfactory where the customary triangular roof-truss design involves the use of exterior gutters. The usual valley gutters are limited in depth to the depth of the purlins, so that their gradient is flat and their capacity limited. To increase their capacity, it is common practice to use wide "box gutters" and obtain as much fall as possible by putting in numerous down-pipes leading into drains constructed in the floors along the bases of the supporting stanchions. This construction is expensive, and the expansion and contraction often breaks the joints of the box gutters. Furthermore, the wide and shallow cross section of the gutters is not an efficient shape for rapid discharge. Hail and snow are apt to block them, with disastrous results inside the building.

Editor's Note—The author, a civil engineer of wide experience in the design of structures, is founder of one of the larger canning companies in Australia with plants at Bathurst and Cowra, N.S.W.

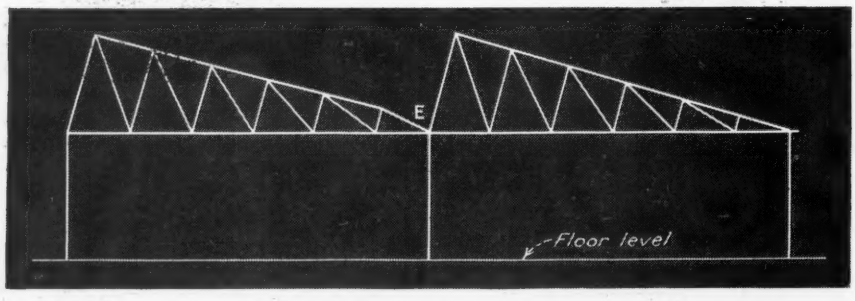


FIG. 1. This shows the general design of the roof trusses with their snub noses.

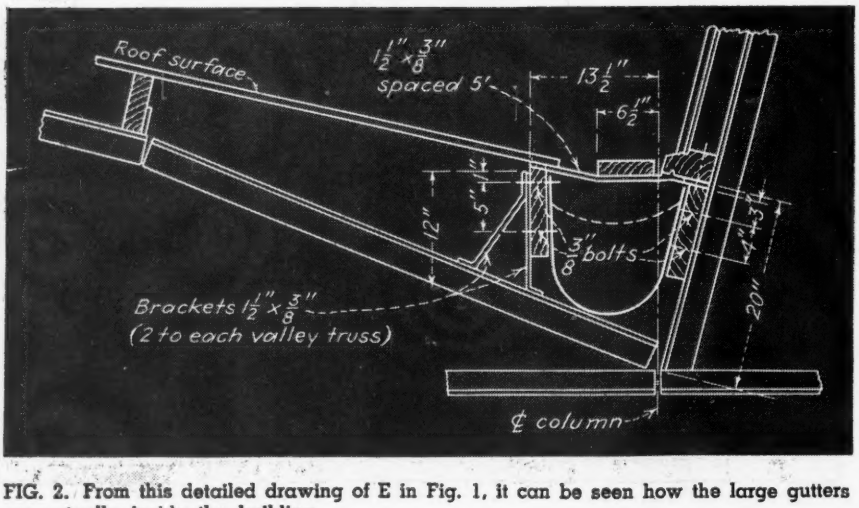


FIG. 2. From this detailed drawing of E in Fig. 1, it can be seen how the large gutters are actually inside the building.

Drainage

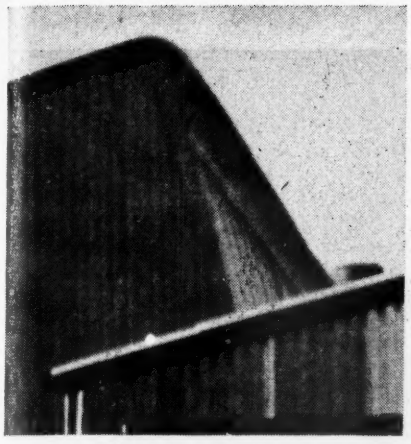
To solve the drainage problem, a really big gutter is needed, one with a steep gradient. But to make room for a large gutter and to avoid the trouble caused by expansion and contraction, it is necessary to place the gutters partly inside the building.

This feature is made possible by the use of a special roof truss with a "snub-nose" (Fig. 1). The roof itself is carried over the snub-nose to the gutter, as shown in Fig. 2. This arrangement allows room for a really big gutter with a cross section of up to approximately 2 sq. ft., and a steep fall. The gutter itself is carried clear across the building to a down pipe outside the structure, and no down pipes or drains inside the building are required for this purpose.

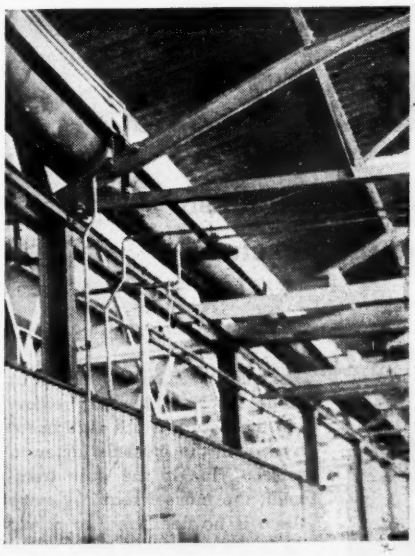
The advantages of freedom from down pipes and drains in floors for carrying away roof drainage are obvious, as is the merit in eliminating their maintenance cost. In our location we suffer from severe hail storms but have very little snow, and after 14 years of experience with this form of gutter we have had no trouble whatsoever. It is also much cheaper to build than the conventional box gutter.

Expansion and contraction problems are taken care of by hanging the top edges of the gutter on slotted holes about 2½ in. long. Through these slots are passed ordinary roofing screws, with a washer before as well as back of the sheet forming the gutter. To permit the expanding or contracting gutter to move freely, the screws are left reasonably loose.

Snub-nosed trusses cost but little



The wind deflector is so unobtrusive that it would escape ordinary inspection. It is seen near the peak of the roof in this exterior view of the plant.



Interior view of plant showing the interior type of large gutter.

more than the ordinary triangular ones, and the overall cost of the completed roof is considerably lower.

Ventilation

Hot vapors and steam must be allowed to escape from a building. Where the saw-tooth roof is employed, it is customary to leave an opening along the top of the vertical side of the tooth, or to have windows or other openings to permit the exit of gases. When the wind blows toward the sloping side of the roof, a strong induced draft sucks the gases out of the building. But when the wind blows in the opposite direction, against the more or less vertical face of the saw-tooth, it enters the openings left for ventilation and prevents the escape of the gases.

To overcome this serious trouble, we have utilized an aerodynamic device in the form of a wind deflector of curved galvanized iron (Fig. 4) which will produce an induced draft even with the wind blowing directly toward the ventilating opening. Wind currents from air blowing against the windows on the vertical face of the saw-tooth are deflected outward in the manner shown in Fig. 3, so that they cannot enter the openings. In practice, it is found that the wind is deflected well above the apex of the roof and well clear of the openings. This results in the desired induced draft and greatly improved ventilation.

The induced draft is much more than one would suppose possible, and we find that, whenever there is a wind from any direction, the ventilation is good. It is only when there is no wind blowing at all that the steam hangs inside the building.

Both of these modifications in saw-tooth roof design have proved to be valuable, yet their cost is negligible.

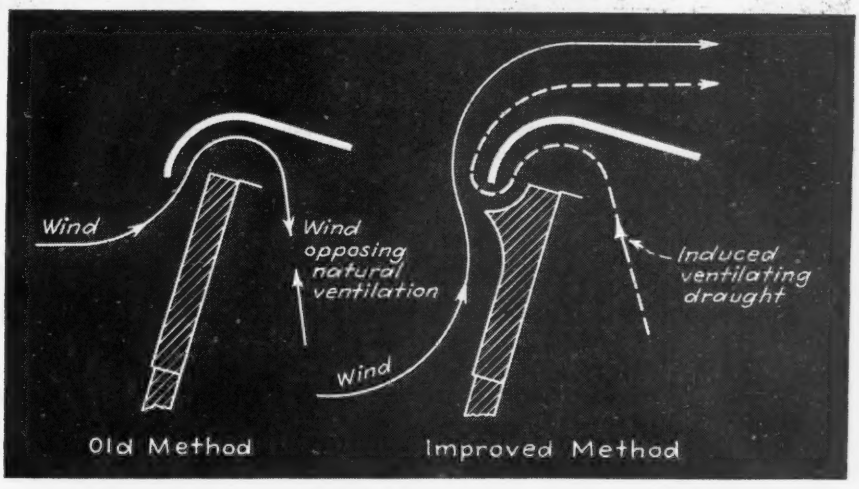


FIG. 3. Illustrating the principle involved in the improved method of inducing draft with the wind blowing against the ventilating slot. Wind currents are deflected outward and well clear of the opening with the improved design.

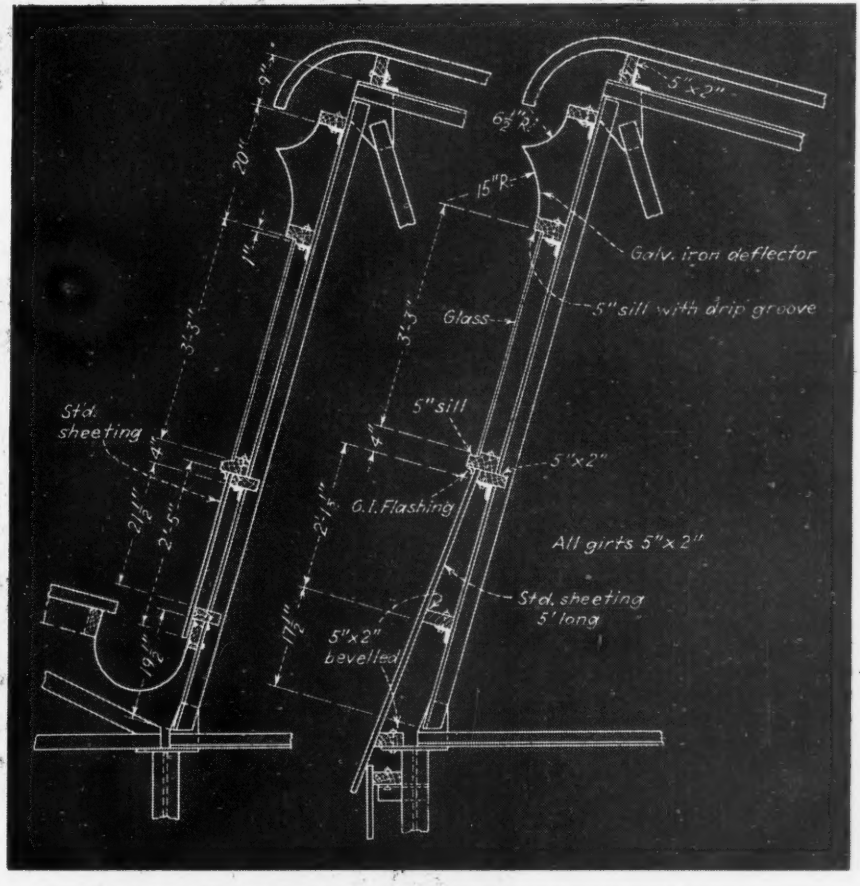


FIG. 4. Details of design and construction of the wind deflectors.

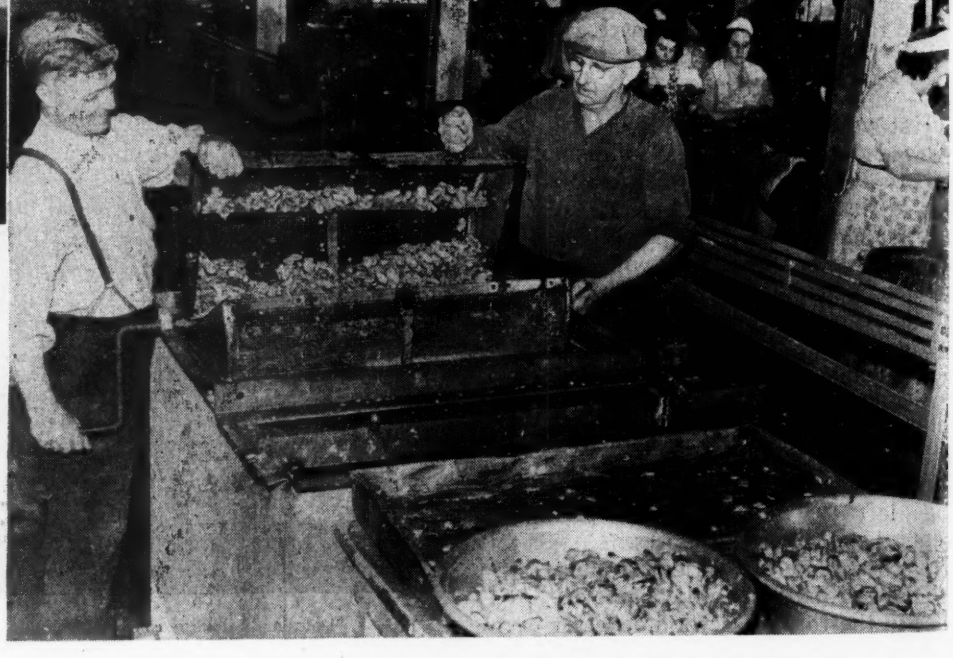
1. Mussels are raked from prolific beds along the eastern coast with long-handled rakes or "dragged" in about 40 ft. of water off Cape Cod. Fishermen, like the one above, average 20 to 25 bu. daily, a bushel weighing about 80 lb.

2. Shucking mussels is easier than shucking clams. After they are steamed in square retorts, the shells open and the mussel meat is scooped out with the thumb, as shown here, while the shell is still hot. Some plants wash the product after shucking.

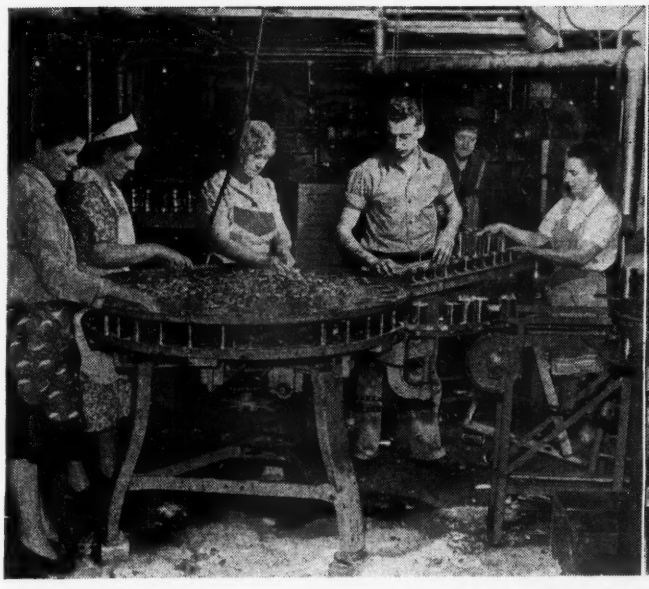
CANNING SEA MUSSELS

The operations involved in transforming mussels from a shellfish to a canned food are shown in these New England plant pictures

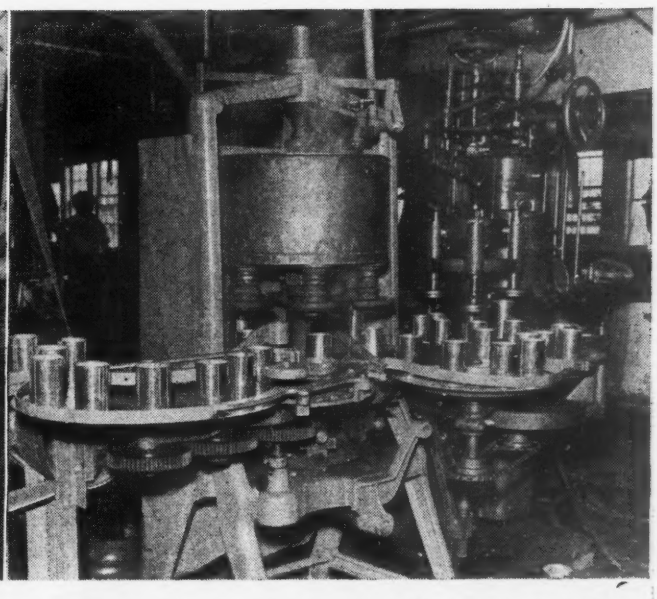
3. These women, working at Monel-metal table, are removing the beard, a tuft of filament by which the mussels fasten to rocks. This is the only treatment the mussel requires since there is no neck and no gristle as is the case with some of the other bivalves.



4. This washer, the squirrel cage, was developed for Gorton-Pew's clam canning. It is used to wash the mussels before they reach the filling tables. The closed cage is turned slowly through the clear water in the tub below to rinse off all remaining sand and dirt.



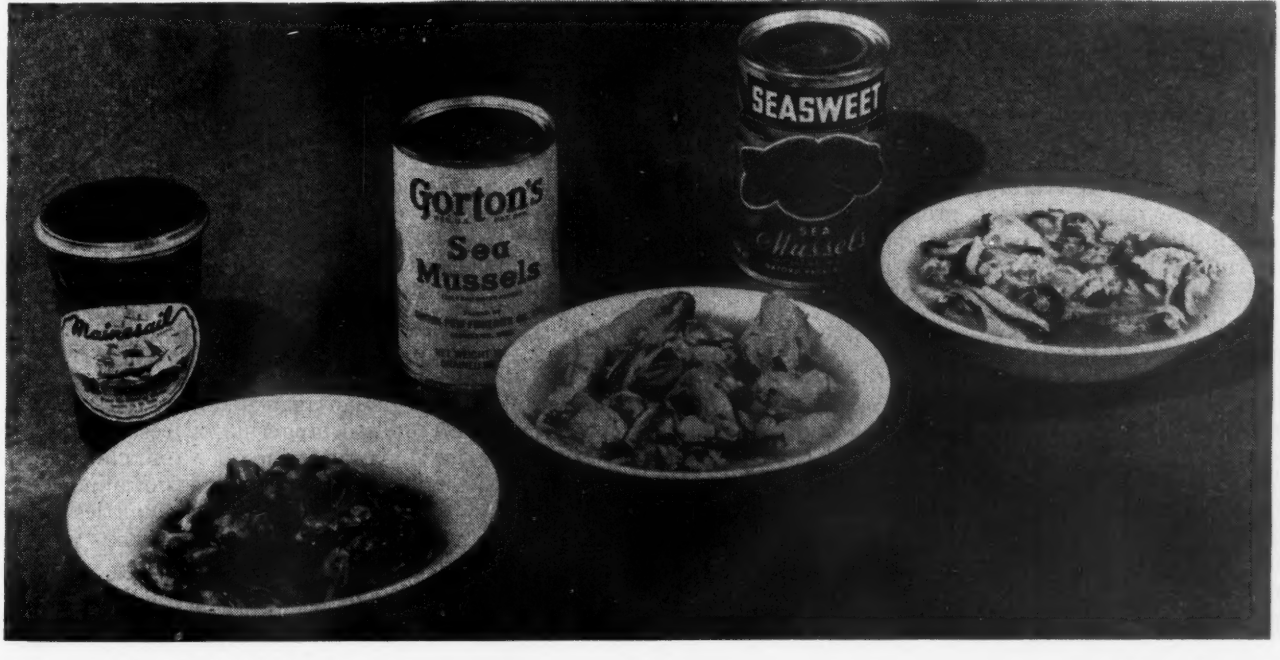
5. Continuous production plants, like Gorton-Pew's at Gloucester, fill cans on a moving conveyor at a filling table such as the one pictured here. Two checkers insure accurate fill of containers. The filled cans travel past the briner and through the closing machine.



6. The briner fills the cans with a hot brine of salt and vinegar as they pass from the filling table to the closing machine, at the right. The brine is prepared in a vat on the floor above and flows through a pipe to the briner. As the brine is at a temperature of 212 deg. F., a partial vacuum is created when the closed can cools.

7. This pile of mussel shells outside the Friendship, Me., plant mounts as the cannery packs 75 cases of 48-oz. cans per day. This represents about 200 bu. of mussels daily, and the plant could pack more if it had more labor. Maine's total pack will be over 2,000,000 lb. this year.

8. Mussel meat varies according to season and beds. Those at the left were harvested in the fall or winter, are smaller, have darker meat and no spawn. The other two, gathered in the spring, have some spawn, are larger and almost salmon-pink. The smaller are said to have a more sea-like flavor.



Citrus groves near Messina, Sicily.

Mandarin and Tangerine Oils

Food processors cannot know too much about their raw materials. This study gives useful information about the botany, areas of production, methods of processing and the physical and chemical characteristics of two food oils

By ERNEST GUENTHER,
Fritzsche Bros., Inc., New York, N. Y.

THERE has been, and still is, confusion regarding the botanical nomenclature of the loose-skinned or kid-glove oranges, as they are frequently called in the United States. Although they possess many identical characteristics, the commonly cultivated loose-skinned oranges can be separated into several rather distinct groups, namely the King, Satsuma, Mandarin and Tangerine. Certain investigators contend that these groups should be recognized as distinct species.[1, 2]

According to an older classification,[1] the mandarin and the tangerine are horticultural strains of the same botanical variety, *Citrus nobilis* var. *deliciosa* Swingle. Later investigations, however, convinced Swingle[3] of the necessity of finding another botanical name for the mandarin type. The most appropriate and oldest valid published name, according to this authority, is *Citrus recticulata* blanco, because of the irregular network of soft, white fibers found between the loose peel and the juice-filled segments. This name was first published by Blanco in his "Flora of Phillipines" in 1837 and antedates by three years *C. deliciosa* Tenore, which was based on the so-called Willow-leaf or China mandarin.

As far as the designation mandarin and tangerine is concerned, both names, are used more or less interchangeably.[4] "Tangerine" is applied more strictly to those varieties producing deep orange or scarlet fruits, while the older term, "mandarin," has been reserved for the yellow fruited varieties. Thus, the differential characters separating the so-called tangerines from the other members of the mandarin group are very slight.

Yet it is a fact, perhaps unknown to some botanists, that there does exist a marked difference in regard to odor and flavor, as well as in regard to physico-chemical properties and chemical composition between the essential oils expressed from the peels of the mandarins and the tangerines.[5]

These differences between mandarin and tangerine oil cannot be explained merely by the different methods of expressing the oil used in the various countries, because Brazil, where identical methods are used, produces both types. The Brazilian mandarin oil resembles Italian mandarin oil and the Brazilian tangerine oil resembles Florida tangerine oil. Soil, climatic and cultural conditions prevailing in the various producing countries might have a certain influence, perhaps fundamental, upon the chemical composition and the physico-chemical properties of these oils.

According to Erlanson,[6] there exist several cases where horticultural strains of the same citrus botanical variety have produced distinctly different oils, and it is therefore not surprising that there should be different oils produced in the mandarin-tangerine series. It is quite possible that we do not grow in the United States the same strain of mandarin as grown in Sicily, and it could well be that the two strains, both considerably hybridized, have developed differently constituted oils.

That there should be similarity between Brazil and Florida in some of these oils is understandable because of the long-standing close collaboration and interchange of plant material between Brazilian and Florida growers. Probably Brazil also has imported the Sicilian strain, which would account for Brazil having one oil like that of Florida and one like that of Sicily.

Oil of Mandarin

The mandarin orange *(Citrus recticulata* Blanco, "Mandarin," syn. *Citrus nobilis* var. *deliciosa* Swingle "Mandarin") a native of China and Cochin-China, was known and extensively planted in China and Japan at a very early date. It was not introduced into Europe and America until modern times. The main producing regions in Europe are in Sicily, Calabria (southern Italy), and Spain (Andalusia) and on the Mediterranean shores of North Africa. Tanaka[7] believes the Mediterranean mandarin to have originated in the Mediterranean region as a chance seedling. His survey of China had failed to locate the true mandarin, although it came originally from China.

The Willow-leaf (or China) mandarin was first introduced by the Italian Consul to New Orleans, La. from Italy between 1840 and 1850, and was later taken from there to Florida and California.

In Sicily, most of the fruit is exported to Central Europe and England, surplus or inferior fruit being processed for essential oils. The harvest takes place during the winter months, at about the same time as that of oranges. The Sicilian mandarin oil, even today, is made almost exclusively by the old sponge method, 1,000 fruit yielding about 400 grams of oil.

In Brazil mandarins, called locally *Mecherica* or *Mexecerica,* are grown on small plantations in the Department of Gonzalo (State of Rio de Janeiro) and around Jaraguá do Sul (State of Santa Catarina). The harvest takes place from April to May. The total production of oil varies around 1,000 kilos (2,204 lb.) per year, but may be increased if the demand warrants it. The manufacturing methods are the same as those used in Brazil for the expressing of sweet orange oil, in locally constructed types of the Sicilian Avena machine wherein batches of whole fruit are rasped against rotating corrugated disks and walls. The yield of oil is about two kilos (4.4 lb.) per ton of fruit. Since they are consumed as fresh fruit in Rio de Janeiro whenever sweet oranges are lacking on the local markets, the mandarins often fetch high prices as fresh fruit, and, therefore, the mandarin oil is usually expensive.

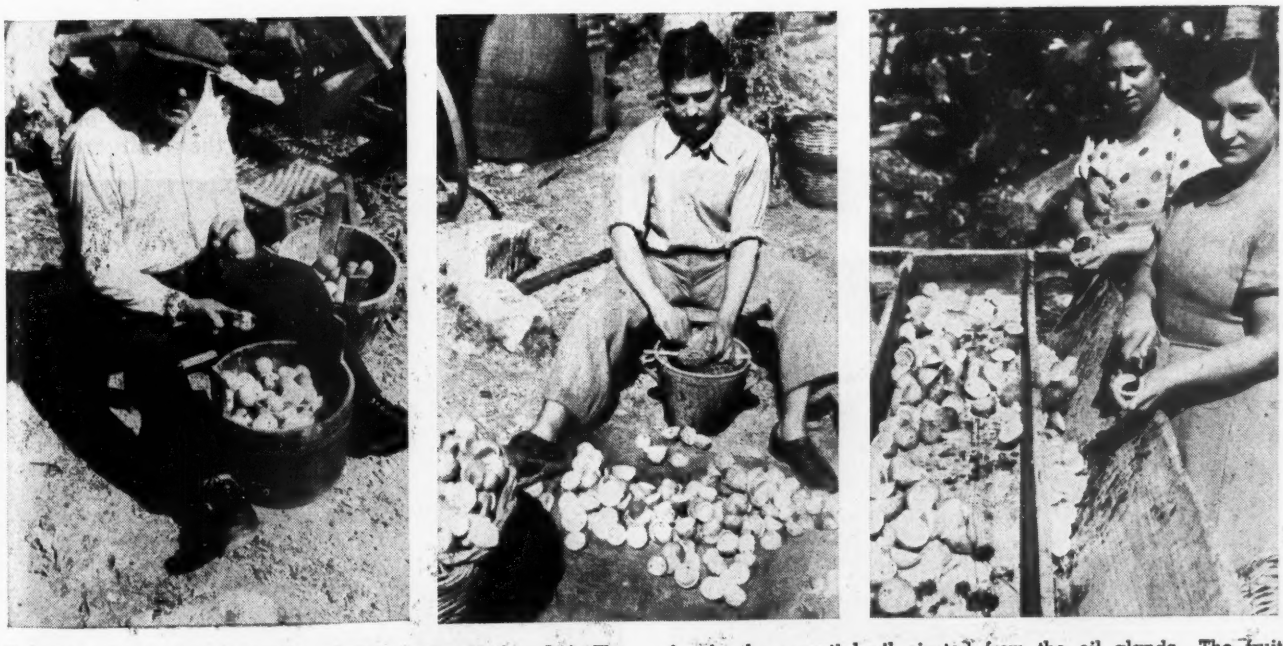
Italian Mandarin Oil

The oil has a very agreeable, somewhat peculiar, odor and shows a bluish fluorescence, especially when diluted with alcohol. Gildemeister and Hoffmann[8] give the following properties for Italian mandarin oil:

Specific gravity at 15°	0.854 to 0.859
Optical rotation	+65°0′ to +75°0′; usually not below +70°0′.
Refractive index at 20°	1.475 to 1.478
Acid number	Up to 2.7
Ester number	5.0 to 11.0; in some cases up to 18.7.
Evaporation residue	2.4 to 3.5 percent
Solubility	Soluble in 7 to 10 vol. of 90 percent alcohol, with more or less turbidity; soluble in 1.5 vol. of 95 percent alcohol but not always clearly.

Shipments of genuine Italian mandarin oils, analyzed in the New York laboratories of Fritzsche Bros., Inc., had properties which varied between the limits which are given below:

Specific gravity at 15°	0.855 to 0.857
Optical rotation (at room temperature)	+69°36′ to +73°15′
Refractive index at 20°	1.4750 to 1.4759
Saponification number	7.5 to 8.8
Evaporation residue	2.4 to 3.2 percent
Solubility	Incompletely soluble in 90 percent alcohol.
Color	Light yellow.



Three steps in the hand pressing of citrus fruit in Sicily. Left: The fruit is cut in half. Center: The pulp is removed with a special kind of spoon. Right: The peel is pressed against a sponge which absorbs the essential oil ejected from the oil glands. The fruit shown here is lemon, but the same process is used for mandarins and tangerines.

Brazilian Mandarin Oil

During the years of World War II when Italian oils were no longer available, Brazil exported limited quantities of mandarin oil to the United States.

Shipments of Brazilian mandarin oils, analyzed by Fritzsche Brothers, varied between these limits:

Specific gravity at 15°	0.856 to 0.858
Optical rotation (at room temperature)	+63°55′ to +72°40′
Refractive index at 20°	1.4758 to 1.4763
Saponification number	7.5 to 9.3
Evaporation residue	3.8 to 4.7 percent
Color	Deep green.

The evaporation residue of the Brazilian oils is usually higher than that of the Italian oils because the latter are made by hand pressing, the former by machine pressing. This fact also reflects in the color of the two types of oil, the Italian oil being much lighter.

The chemical composition of Italian mandarin oil differs from that of the Florida tangerine oil mainly by the presence of methyl anthranilic acid methyl ester which imparts to the Italian oil its characteristic fluorescence and odor.[5] The following constituents were identified in Italian mandarin oil:

D-limonene—According to Gildemeister and Stephan,[9] Italian mandarin oil consists mainly of d-limonene. The boiling point of the limonene fraction is 175 to 177 deg. at 760 mm.; α_D + 76° 45′. Tetrabromide melting point, 104 to 105 deg.

Aldehydes (?)—When treating the distillation residue with bisulphite solution, a double salt was obtained and an oil regenerated with alkali. Its naphthocinchoninic acid did not show a definite melting point. Therefore, it remains doubtful which aldehydes correspond to this compound.

N-methyl anthranilic acid methyl ester—This important constituent of Italian mandarin oil was found by Walbaum.[10] Less than 1 percent of this ester is present in Italian mandarin oil, yet it has considerable influence upon the odor of the oil. Hesse and Zeitschel[11] developed a method of determining n-methyl anthranilic acid methyl ester quantitatively.

It might be interesting to note in this connection that the oil distilled from the leaves of the mandarin tree (Mandarin Petitgrain oil) contains from 50 to 65 percent of n-methyl anthranilic acid methyl ester.

Italian mandarin oil has been used principally as a modifier of various types of sweet orange oils, at times being used quite extensively for this purpose by manufacturers of beverage extracts. It has also found similar employment in the bouqueting of sweet orange oils for the flavoring of confectionery, including both hard candies and soft centers.

In addition to these applications, the oil finds good use in the flavoring of various liqueurs and cordials, including the well known mandarin liqueur.

Oil of mandarin also finds a limited, but very useful application in the production of certain perfume effects, particularly in the French type of bouquets.

Oil of Tangerine

In the United States the best known, most cultivated and most highly priced of all the loose-skinned oranges is the Dancy tangerine *(Citrus reticulata* Blanco "Tangerine," syn. *Citrus nobilis var. deliciosa* Swingle "Tangerine"), universally shipped under the name of tangerine. The largest plantings are located in Florida, but California, too, possesses a considerable acreage.

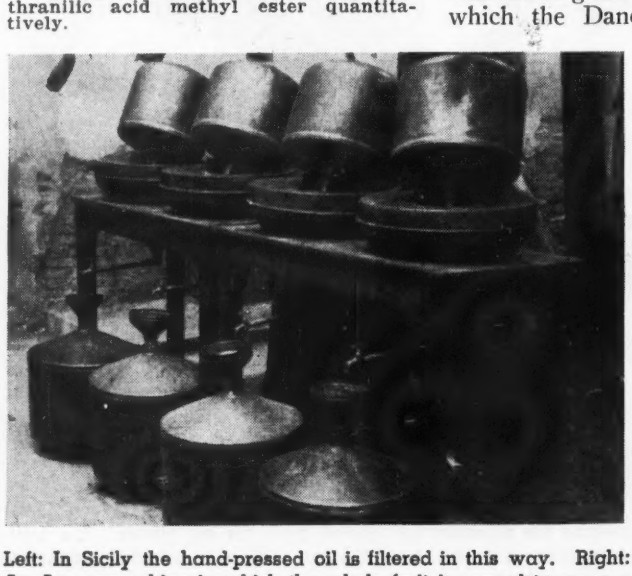
How and when the first tangerines reached Florida cannot be determined now, but according to Webber[12] it is reasonable to assume that the original tangerine type from which the Dancy descended came from China to the United States, probably by the way of Mediterranean Europe. A very similar form of tangerine is cultivated also in China, Formosa and Japan.

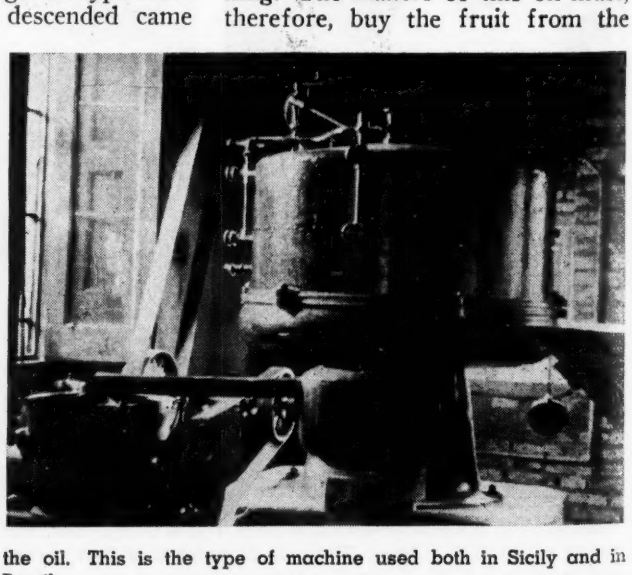
The Dancy originated probably from a seedling grown at Buena Vista, St. Johns County, Florida, in the grove of Colonel George L. Dancy, who introduced this variety into cultivation around 1871 or 1872. Today about 95 percent of the tangerines grown in Florida are of the Dancy variety. Practically all of the Florida tangerine oil is expressed from peels of the Dancy. The fruit ripens from December to March.

In spite of the apparently close botanical identity of tangerine and mandarin, commercially the oils tangerine and mandarin must be regarded as entirely different products from the standpoint of practical use. Mandarin oil possesses a very distinctive and characteristic flavor to which it owes its value for flavoring and perfume work. The oil tangerine of commerce, on the other hand, is hardly to be distinguished from an orange oil and bears no resemblance to commercial mandarin oil. It may be regarded as just another orange oil and not a very good one.

Process Used in Florida

While Florida sweet orange and grapefruit oil are distinctly by-products in the canning of juice and fruit segments ("hearts"), the manufacturing of Florida tangerine oil represents an independent, separate industry for the simple reason that neither fruit nor juice from loose-skinned oranges lends itself to canning. The makers of this oil must, therefore, buy the fruit from the





Left: In Sicily the hand-pressed oil is filtered in this way. Right: An Avena machine in which the whole fruit is rasped to express the oil. This is the type of machine used both in Sicily and in Brazil.

growers and process it exclusively for oil. For this purpose the fruit is first thoroughly washed and then passed between heavy rolls provided with capillary grooves (Pipkin Oil Peel Press, as employed for expressing Florida orange and grapefruit oil), or through a tapered screw press. The latter consists essentially of a screw with a progressively shallow depth of thread which serves to squeeze the fruit against a perforated screen, thereby extracting the juice, the oil and the aqueous cell liquid. The best example of this machine is the well known Anderson expeller. The resulting effluent from the rolls must be screened in order to remove the pulp; the emulsion of juice and oil is subsequently separated in high-speed centrifugal separators. The clarified oil, after storing in a refrigerator, is finally filtered. It possesses a bright orange color and a characteristic odor and flavor.

The yield of oil amounts to about 1⅓ lb. per ton of juice.

Brazilian Oil

Seedling tangerines of nearly the same type as the Dancy are cultivated in several parts of the world, for instance, in Southern Europe, Algeria, South Africa, and especially in Brazil.

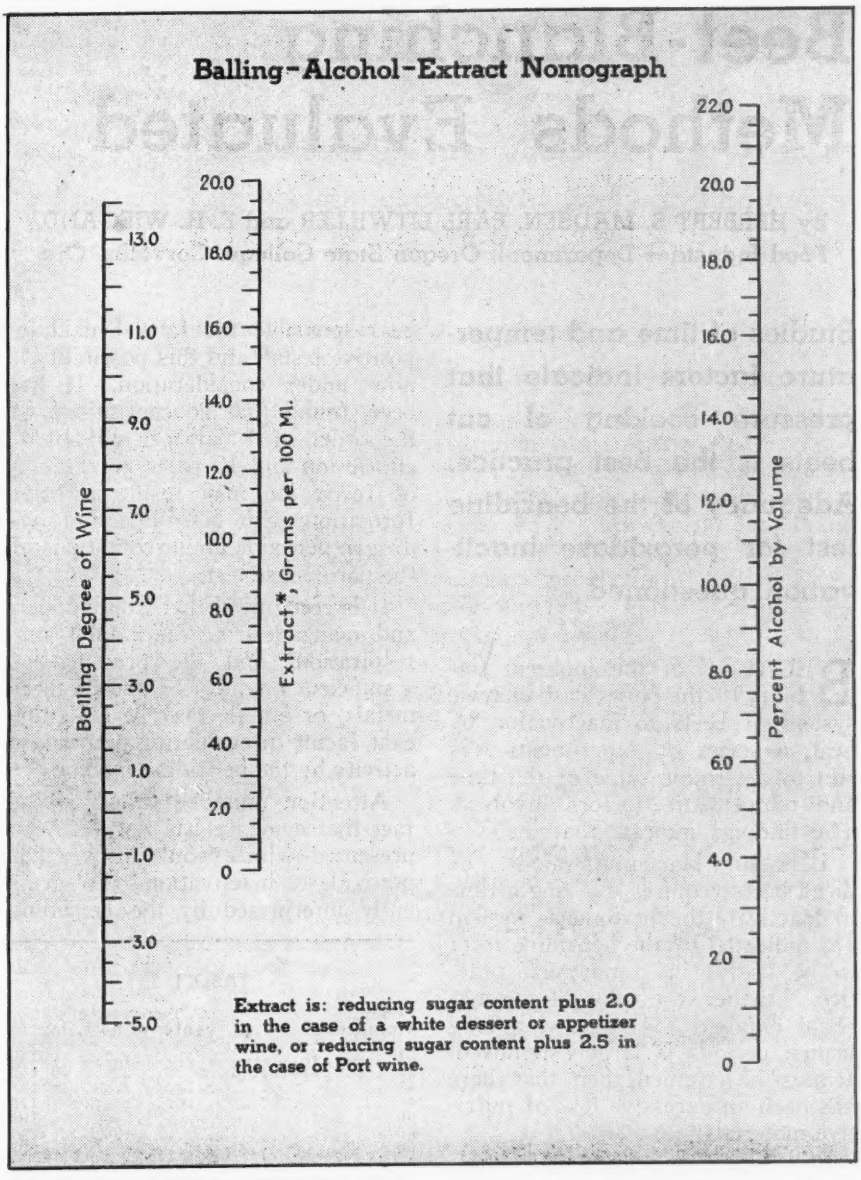
In Brazil the tangerine, locally called *laranja cravo,* is grown on small plantations in the State of Sao Paulo in approximately the same sections as the sweet oranges. Since it is sold mainly as edible fruit, it fetches high prices, which results in only a small production of oil. The harvest takes place from April to June. After that period, the peel becomes so loose that it comes off easily, thereby making it almost impossible to treat the fruit in the type of Avena machines serving in Brazil for the expressing (rasping) of citrus fruit. Depending upon the type of machinery and the working method, the yield of oil ranges from 2.0 to 2.5 kilos of oil per ton of fruit. The total tangerine oil production in Brazil amounts to about 5 tons per year.

Physico-chemical Properties

The Food Distribution Administration, U.S. Department of Agriculture, Washington, D. C., in 1943, suggested the following specifications for oil of tangerine:

Specific gravity at 25°	0.846 to 0.852
Optical rotation at 25°	+90°0′ to +95°0′
Refractive index at 20°	1.4755 to 1.4769
Color	Bright to deep orange

(*Turn to page* 124)



Convenient Chart for Vintners

To PROVIDE for wine manufacturers a simple means of estimating the extract or reducing sugar content in a dessert or appetizer wine, Wine Institute has prepared the above Balling-alcohol-extract nomograph. Extract or reducing sugar content can be determined with this chart when the alcohol content by volume and Balling degree of wine are known. And the nomograph also can be used to calculate the approximate percent of alcohol by volume or Balling degree when the extract or reducing sugar content is one of the known quantities.

When the unknown quantity is reducing sugar: (1) Lay a ruler across the chart so that its upper edge intersects the two known quantities, alcohol and Balling degree. (2) Read the number at the point where the upper edge of the ruler crosses the extract line. (3) Convert extract to reducing sugar by subtracting 2.0 in the case of white dessert or appetizer wine, or 2.5 in the case of Port wine.

When the unknown quantity is either alcohol content or Balling degree: (1) Lay a ruler across the chart so that the upper edge intersects the lines of the known quantities, one of which must be extract (reducing sugar plus 2.0 in the case of white dessert or appetizer wine, or reducing sugar plus 2.5 in the case of Port wine). (2) Read the number at the point where the upper edge of the ruler crosses the line of the known quantity, either alcohol content or Balling degree.

The chart gives the most accurate results when computing reducing sugar content. No quantities computed should be considered absolutely accurate, but only reasonably close approximations.

Beet-Blanching Methods Evaluated

By HERBERT S. MADSEN, EARL LITWILLER and E. H. WIEGAND,
Food Industries Department, Oregon State College, Corvallis, Ore.

Studies of time and temperature factors indicate that pressure cooking of cut beets is the best practice. Adequacy of the benzidine test for peroxidase inactivation questioned

BECAUSE of the apparent stability of the peroxidase enzyme system of beets to inactivation by heat, a series of experiments was run to determine some of the time and temperature factors involved. The findings indicate that:

1. Steam blanching, alone, of diced beets requires too long a time to inactivate the peroxidase system (as indicated by the benzidine test) to be useful in commercial practice. Further, the color of the material exposed to excessively long blanch periods is largely removed. It must be assumed, then, that there has been an excessive loss of nutritive materials.

2. Pressure cooking of the whole beets at 240 deg. F., for a sufficient length of time to produce a negative benzidine reaction with material taken from the center of the beet, so overcooks the outer portion as to render it soft and unusable.

3. Pressure cooking of beets cut for dehydration (diced or in strips) allows the most economical control and produces a benzidine-negative product.

4. Where proper equipment is lacking to retort cut material, a combination of whole-beet retorting, plus a short steam blanch, is effective in producing a benzidine-negative product.

5. It appears, from the unusually long periods required to produce benzidine-negative beets, that there is present in the vegetable a thermostable substance (or substances) that can catalyze the H_2O_2-benzidine reaction to give the color test.

It is possible that metal ions may be responsible for false benzidine-positive tests[5], and this possibility is now under consideration. It has been found that concentrations of the order of 1 part per million of cupric ion and 10 parts per million of ferric ion may result in color formation with benzidine and hydrogen peroxide under conditions of the peroxidase test.

It is recognized that iron, copper, and manganese act as catalysts in respiration[3] and the presence of a sufficient quantity of one of these metals, or others, may be a significant factor in evaluating peroxidase activity by the benzidine method.

Attention must be called to the fact that evidence has not yet been presented which would prove that peroxidase inactivation (as presently interpreted by the benzidine test) is essential to quality retention in the storage of dehydrated beets.

The beets used in these experiments were large, were of the Detroit Dark Red variety, and were grown commercially for canning and dehydration. The large size was chosen because plants that are both canning and dehydrating usually divert the large beets to dehydration.

The range of blanching times was chosen to be within that feasible for commercial operation. Continuous blanchers designed to retain a product for more than 20 minutes must either be very long or move the product very slowly to obtain the necessary blanching exposure.

TABLE I

Time (minutes)	Temperature at center of beet, deg. F.
31	150
35	156
40	168
45	178
50	190
55	211
60	228

TABLE II

Time (minutes)	Temperature at center of beet, deg. F.
0	126
5	130
10	138
15	146
20	158
25	167
30	177
35	187
40	195
45	201
50	207
55	213
60	217

TABLE III

Time (minutes)	Temperature at center of beet, deg. F.
0	114
5	130
10	150
15	166
20	180

TABLE IV

Time (minutes)	Temperature (deg. F.)
1	180
1½	190
4	212

Experimental Procedure

Raw, washed beets were sliced and placed in a wire basket in a small, manually controlled, vertical retort. After 10 minutes at 240 deg. F., the benzidine reaction was positive. Retorting for 15 minutes at 240 deg. F., gave a negative benzidine reaction. In the latter case the color leached badly from slices.

A raw, washed whole beet (approximately 3½x5 in.) was placed in the retort. Then one thermocouple lead of a potentiometer pyrometer was inserted to the center of the beet and one lead was suspended in the atmosphere of the retort. The beet temperatures in Table I were observed with the retort temperature held at 240 deg. F. (± 2 deg).

For the benzidine test, a slice was taken through the center of the beet. A positive reaction was shown at the center and at the next adjacent zone in the region of the vascular bundles.

The beet was quite soft, but probably could be diced or cut into strips by conventional equipment.

The method used for testing for peroxidase was that recommended by the Western Regional Research Laboratory of the U. S. Department of Agriculture, Bureau of Agricultural and Industrial Chemistry.[4]

Simulating commercial practice, a large beet (approximately 3x4½ in.) was precooked in boiling water for 25 minutes, cooled 2 minutes in water, and placed in the retort. Thermocouple leads were placed as in the previous experiment and the retort temperature was 240 deg. F. (± 2 deg). The best temperatures in this case are given in Table II.

A slice through the center of

(*Turn to page* 146)

NEW MENU IN ENGLAND

The altered food program forced upon the British by the sharp cut in wartime imports is outlined here, suggesting some important changes in postwar England's food demands, which will have repercussions in the American export market

By MARTIN GOTZ, British Economic and Financial Journalist

SOME of the wartime changes in Britain's food habits are likely to have a pronounced effect upon the country's consumption when peace again is restored to the isles on the right side of the channel. A recent official statement, issued in London, presented a survey of the present level of average food consumption, which should be significant to food importers in England and food exporters in the United States and the Dominions.

Total supplies of calories are 2,827, only 5 percent lower than before the war. Protein supplies are 7 percent higher, due to the rise in consumption of vegetable protein. Carbohydrates show an insignificant decline, but fat consumption went down by 15 percent. In vitamins, the wartime diet proves superior to former food habits and consumption of iron and calcium has increased, mainly through the higher flour extraction rate and through the addition of calcium to flour.

More Fresh Milk

Consumption of milk and milk products, excluding butter, has risen by nearly 30 percent. This is due to the increased consumption of fresh milk, mainly as a result of the provision of milk—free or at a low price—for expectant mothers and children, and to the importation of dried milk and cheese. Meat consumption, including canned meats and offal, on the other hand, has fallen by about one-fifth, mainly as a result of the reduced domestic production. To obtain the largest output from the soil, wheat and potato growing is given preference to the raising of livestock for slaughter. Supplies of poultry and fish have been reduced by nearly 40 percent and of eggs by 6 percent. Fish is scarce, and the production of poultry and eggs has been severely restricted to save imported feeding stuffs. More than half of the present egg supply is in dried form. The supply of fats is 15 percent lower than before the war, but butter supplies alone declined by 70 percent. Sugar supplies have been reduced by about 30 percent.

British Combine

This little English maid seems to agree that a raw carrot a day is a grand idea. And she is not alone among her fellow countrymen in approving many of the wartime changes in Britain's food economy, which are apt to effect postwar imports.

The scarcity of fruit is felt, though its nutritional value is being replaced by the increased consumption of vegetables. Supplies of tomatoes and citrus fruit have fallen by 45 percent, of other fruit by 50 percent. Through increased home production, consumption of fresh tomatoes has been restored to the prewar level, and in the past few months the first cargoes of oranges were imported for general distribution. There has been also an appreciable decline in the supply of beans, peas and lentils, while edible nuts have disappeared.

On the other hand, the amount of bread and other grain products eaten has increased by 17 percent, and the consumption of oatmeal, produced at home, has nearly doubled. Import requirements of wheat have been appreciably reduced through the higher extraction of flour and through the increased acreage under wheat. Potato consumption has risen by 45 percent. Neither bread nor potatoes are rationed. Lastly, supplies of vegetables have risen by no less than one-third, largely as a result of the increased production in private gardens and allotments. The prominence now given to vegetables, especially salads and potatoes, in Britain's meals has certainly contributed greatly to the maintenance of a balanced diet.

Home Grown Foods

Britain's food does lack peacetime variety, and the housewife must give some thought to the planning of the meals—but all basic requirements are assured. This would not have been possible without the remarkable achievements of Britain's agriculture, which increased production by 70 percent (on the basis of calorific value) since the outbreak of the war. This required a change in the agricultural pattern. Since the beginning of the war, the area under crops has been increased by over 60 percent through ploughing-up of grassland at the expense of livestock-farming, which also has suffered from the reduction in imports of feedstuffs. Special care is given, however, to the maintenance of milk production. Shortage of labor has been relieved by increased mechanization, as there are now 150,000 tractors on Britain's farms as against 55,000 before the war.

As a result of this wartime farming effort in Britain, about two-thirds of the nation's food is now derived from her own soil. Of the imports, nearly one-third comes from the United States under Lend-Lease, comprising such foods as dried milk, dried eggs, canned meat and fish. But the share of the Dominions foodstuffs cannot be overlooked. Australia and New Zealand supply meat, butter and cheese, while Canada exports bacon, cheese, eggs and butter to Britain.

How To Take Care Of Synthetic Tires

By giving this scarce rubber the kind of care that is described here, the truck fleet operator can curtail costly wear and even more costly operational delays due to tire failure

THE supply of synthetic tires, in the large sizes, will be at a most critical stage during the remaining weeks of this year and the early months of 1945. Fleet owners in the food field, therefore, must give exceptional care to the synthetics they do get if they want to keep their trucks running.

The problem, in a nutshell, is that our diminishing surplus of natural rubber, coupled with our continued tremendous military demands, has kept production of synthetics in the large truck sizes below the commercial demand. In addition, the larger-sized synthetics are more susceptible to bruising and failure than equivalent tires of natural rubber.

While the reports of trucks laid up for lack of tires have not yet added up to alarming proportions, the danger ahead has not been minimized. The Office of Rubber Director increased the August quota from 60,000 to 85,000 tires in sizes from 8.25-20 up. The September and October quotas have been increased to 102,000. In an attempt to place the available tires where they are most vitally needed, WPB also has issued a new tire esssentiality list. This is being used by OPA boards in consultation with ODT offices in double-checking all new tire applications.

But with all agencies doing everything in their power to get the supply to meet the demand, the wise owner of trucks hauling food products will baby all the synthetics he can get so that he will not have his trucks down for lack of tires.

Weaknesses of Synthetics

There is no intention here of suggesting that large-sized synthetic tires are not good tires. They are subject, however, to earlier failure than equivalent tires of natural rubber because of the tendency of the synthetics to run hotter. The higher the operating temperature of a tire, the more readily does it fail. The tensile strength of synthetic rubber, moreover, is substantially less than that of similar compounds of natural rubber. In the synthetic tire, the cords must do a larger percentage of the job of withstanding bruises.

Great progress has been made in the building of large synthetic tires, particularly in the past few months. In this connection, it must be remembered that the rubber industry's chemists, engineers and technicians have been working on synthetic rubber for a little over 100 weeks, as compared with over 100 years' continuous experience with natural rubber. It is quite possible that before natural rubber again becomes available in quantity, the industry may have perfected a synthetic tire able to compete with the natural rubber tire on virtually even terms.

Since last April, all tire manufacturers have used S-5 and S-7 compounds in all sizes from 8.25, 9.00, 10.00 through 11.00-22. The S-5 and S-7 compounds contain 65 percent natural rubber and 35 percent synthetic. These compounds are used with a rayon carcass instead of a cotton carcass to better withstand the tire heat developed in operation.

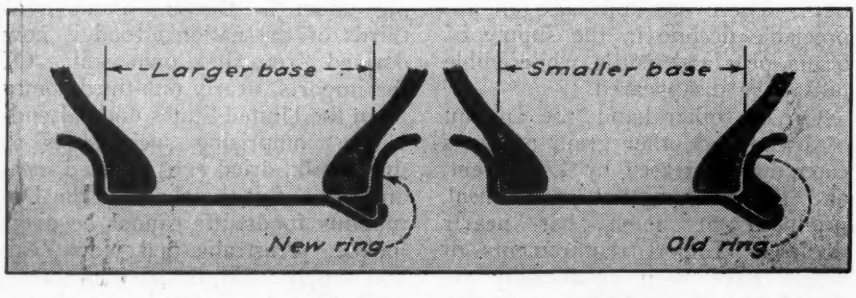
In the operation of a tire in service, there is a definite relationship between the air pressure buildup and the temperature of the tire. For each pound of buildup, the temperature increases 8½ deg. Thus, if the buildup in pressure is 20 lb., the temperature in the tire is 8½ times 20, or 170 deg. If the atmospheric temperature, say 90 deg., is added, it gives a temperature of 260 deg. Since tires are cured at approximately 265 deg., it is seen that the chances of a tire performing satisfactorily at 260 deg. are slight.

With synthetic tires susceptible to failure under heat, it is obvious that the food truck owner, to get full value from his tires, must see that they are operated so as not to overheat because of underinflation, high speeds or overloading. The effects of these abuses are shown in the accompanying tabulation.

In brief, synthetic tires must be babied as tires have never been babied before. This means no under- or overinflation, no overspeeding, and no overloading. It also means that duals must be matched so that each tire carries the same load. Tires should be switched regularly and removed for recapping before their treads are worn through. Small cuts and bruises should be repaired immediately, and tire inflation pressures should be checked daily.

Effects of Underinflation, Speed and Overload on Truck Tires

Percent of underinflation	Percent loss in mileage	Relative mileage	Speed in m.p.h.	Percent decreased mileage	Relative mileage	Percent of overload	Percent decreased mileage	Relative mileage
0	0	30,000	25	0	30,000	0	0	30,000
10	5	28,500	40	12	26,400	10	18	24,600
20	16	25,200	45	22	24,400	20	30	21,000
30	33	20,100	50	33	20,100	30	42	17,400
40	57	12,900	55	45	16,500	40	52	14,400
50	78	8,600				50	60	12,000



At the left is a drawing of Goodyear's new side rim ring, which provides about ½ in. wider tire base than the ordinary rim of the same size, illustrated at the right.

Appoint a Tire Man

It is one thing for management to says that synthetic tires should not be abused, but it is quite another to prevent such abuse. In many instances the follow-through has been accomplished most easily by appointing a "tire man," a man with a tire background, and making him responsible for tire maintenance. To succeed, he must have the full backing of his superiors.

An inexcusable waste of rubber is illustrated here. The tire has been permitted to run on a wheel out of line, thereby wearing the tread through the outside plies.

This necessary backing includes fullest cooperation by the operating and maintenance superintendents of the fleet. With such assistance, the selected tire man can set up a system of preventive maintenance on tires.

Make a Load Analysis

One of the first things to be done is to make a load analysis of the tires on each vehicle and set up allowable tire loads in conformity with the limits for synthetics as set by the Tire and Rim Association tables. The cooperation of the operating superintendent is necessary to prevent overloadings. Since overloading heats up the tires and since excessive heat is disastrous to synthetics, all subsequent efforts by the tire man in the actual care of the tires may be nullified by too heavy a load.

The operating superintendent and the truck drivers also play important parts in preventing overspeeding. Frequent meetings of the drivers should be held to continually remind them to do their part in keeping the precious synthetics running.

The tire man may personally take over the jobs of tire inflation and the daily checking of tire pressures. Underinflation and overinflation are equally injurious. Underinflation causes the tires to flex more, and this tends to build up extra heat in the tire carcass. Overinflation, on the other hand, puts the cords under a higher degree of tension. This may cause the cords to break under road impacts, especially in synthetics, because of the greater stiffness of the compound.

Inflation pressures should be checked when the tires are cold. The recommended inflation pressures of the Tire and Rim Association are cold pressures. Since the pressure in a tire builds up under use, due to the heat generated in the tire itself, the recommended proper pressure, checked when the tire is hot, would be too low when the tire cools. This is the reason tires should not be "bled" when hot to reduce the pressure caused by the heat of operation.

Synthetic tires should not be run flat, even for short distances. In many cases, running flat loosens the cords of the inside plies so that the whole casing has to be scrapped.

One of the principal duties of the tire man is to see that all tires are removed for retreading before the treads are worn through. If retreading is delayed, it may lead to a weakening of the undertread, which will show up only after the retreading is finally done.

Wider Rims Help

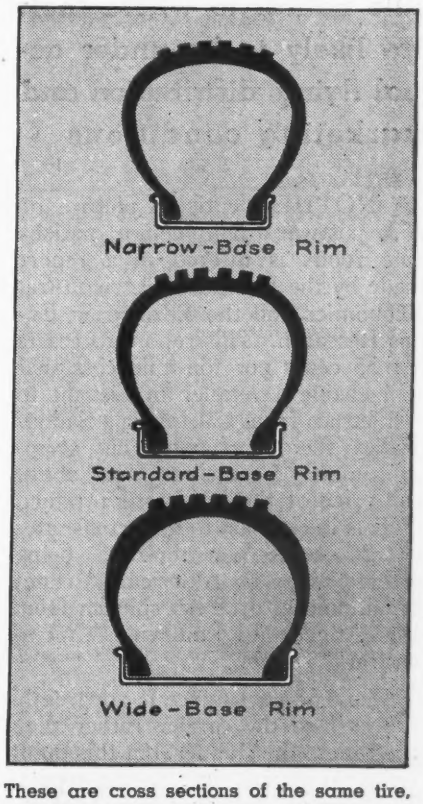
The use of wider rims and attention to rim maintenance generally also serve to increase the life of synthetics. Narrow-base rims tend to pinch the tires at the beads and thus cause premature failures. The use of wider base rims, if this is practicable in connection with wheel and chassis clearances, improves this condition as shown in one of the accompanying illustrations.

Out-of-round rims and the use of mismatched removable side flanges both cause unnecessary tire failures. It is also important to clean and coat the rims with an approved nonoily rim paint when tires are changed.

As shown in one of the accompanying illustrations, Goodyear Tire & Rubber Co. has developed a new type side ring, for use with its former rims, which gives about ½ in. wider base without increasing the size of the rim.

Change-over to these new rings can be made where it is impossible to change to wider rims because of insufficient clearance next to the truck. On rims used as duals, the rings reduce the clearance between the tires, which is especially advantageous on high-crowned roads. Excessive spacing between duals on high-crowned roads tends to cause uneven tread wear because the tires are not evenly loaded.

The tire bead, on these rings, is supported throughout its circumference by a tapered bead ledge. This support eliminates improper centering of the tire on the rim, thus preventing bead chafing as well as the pulling out of bead wires.



These are cross sections of the same tire, showing the beads badly pinched on the narrow-base rim and pinched to some extent on a standard-base rim. The wide rim improves this condition, giving greater tire mileage.

Loading foods for airshipment from West Coast to New York for special luncheon.

Report Tailspins Airfreight Costs

By J. A. J. JONES, Assistant Editor of "Food Industries."

But more sober reflection puts the postwar rates a little nearer to where they are likely to be under actual flying, distribution and marketing conditions

ANOTHER enticing picture of postwar airshipment of perishable foods is offered in a report made by the Bureau of Agricultural Economics and the Edward S. Evans Research. This report forecasts a 6.55 cents per ton-mile cost that will enable a retailer in Detroit to sell lettuce from California's Salinas Valley, the day after it is cut, at approximately 5 cents per pound above the price of the rail-borne product. This is in contrast to the actual rates of 26 cents per ton-mile being offered today by American Airlines on shipments of fresh spinach from Los Angeles to Louisville, Cincinnati and Dayton.

The 6.55-cent figure is apparently the cost to the carrier rather than the rate to the shipper, but this point is by no means clear in the report. The estimate, however, does contemplate ideal shipping conditions, including "a hypothetical contract-carrier service, to operate on an extremely economical basis," employing a fleet of eight planes carrying full loads totaling 68 tons of lettuce daily from and to specific points. It also contemplates a return cargo of at least three-fourths capacity.

In similar fashion, the report arrives at a per pound cost of 9.33 cents. From this is deducted a stipulated rail rate of 2.96 cents, leaving a differential of 6.37. Further economies then bring this differential down to 5 cents per pound.

It may be that other estimates do not contemplate operation on such "an extremely economical basis," or it may be that other estimates have taken a more realistic view, but whatever the reason, they are far from 6.55 cents per ton-mile.

Edward Warner, vice-chairman of the Civil Aeronautics Board, writing in the October issue of *Air Transport*, states that approximately 6,000,000 ton-miles of traffic per year were handled by air-express immediately before the war, at an airport-to-airport rate of 50 cents per ton-mile. "A great deal of confusing nonsense," he says, "is being written on the cost of moving cargo by air." He points out that planes will not actually be loaded to capacity on every flight. In railway freight service, more than one-third of all freight car miles are run empty. Various conclusions are being reached by ignoring such items as overhead and pick-up and delivery charges, which are included in the rail rates, but not in airport-to-airport costs. By dispelling pleasant but misleading dreams of that order, Mr. Warner reaches the conclusion that airport-to-airport minimum rates will be somewhere between 25 and 30 cents per ton-mile, which allows for a 65 percent load factor and assumes restoration of prewar price levels.

The cost of air cargo will go down, he adds, with the increase in size of aircraft and greater efficiency, but it is not easy to see how an actual rate of less than 15 cents per ton-mile can be justified by any developments in aircraft or operating methods that are now visible.

These predictions are in line with present-day operations of the air carriers. In the American Airlines case, the spinach shipped from Los Angeles to Louisville, Cincinnati and Dayton at 26 cents per ton-mile was sold at 29 cents per 10-oz. in a cellophane package. Washing, trimming and packaging was accomplished before shipment. This sale price was in contrast to locally grown spinach, unwashed and untrimmed, selling at 17 cents per pound.

In no case have air borne perishable foods been marketed in sufficient volume to determine the demand. Food people are skeptical that even the "carriage trade" will continue willing to pay premium prices for such commodities as spinach and lettuce after the novelty has evaporated. They consider it likely, however, that a continued demand, in appreciable volume, can be stimulated for air shipments of such otherwise unobtainable items as tree-ripened dates, bananas and citrus fruits.

The answer to be derived from this profusion and confusion of forecasts, apparently, is that the food industry will depend upon refrigerated rail cars for shipping perishables in volume for a long time.

Utilization of Nutrients in Milk

Calculations have been made to determine how much of each of the four principal organic nutrients in milk is used in the various foods and animal feeds

By EARLE O. WHITTIER, Division of Dairy Research Laboratories, Bureau of Dairy Industry, Agricultural Research Administration, U. S. Department of Agriculture.

IT may be surprising that less than two-thirds of the total quantity of organic nutrients in milk goes into food for people. And only about one-fifth of the amount contained in skim milk is so used.

For several years the Bureau of Dairy Industry has published a "Statistical Flow Sheet of Milk" which shows the quantities of milk utilized annually in the United States in manufacturing the different milk products and the quantities of products made. Because of the current interest in increasing the utilization in food of the less popular, but highly nutritious, components of milk, calculations have been made to show the quantities and percentages of the four organic nutrients of milk that are utilized in various ways in food for human beings and in feed for animals.

The methods of calculation are believed to be sound, since the sum of the quantities of each nutrient in the different products agrees remarkably well with the quantity of each calculated to be present in the total milk, as shown in Table I.

In Table II, it appears that 40.1 percent of the milk fat produced on farms in 1942 was utilized in market milk and cream and that, of the four organic nutrients considered together, 31.6 percent was utilized in this way. Butter accounted for 36.2 percent of the fat, but of only 11.6 percent of all of the organic nutrients. Nearly 50 percent of the casein, whey, protein and lactose produced in milk in 1942 went with the skim milk and its products, but only 1.2 percent of the fat.

Table III indicates the distribution of the skim milk nutrients shown in the third line of Table II.

Table IV is a distribution of the organic nutrients of total milk and of total skim milk between food and feed. The difference between the sum of nutrients used for food and feed (Table IV) and the nutrients in total milk (Table I) indicate the quantities of each used in making industrial products—principally casein—and lost in manufacturing processes. Table IV also indicates that 63.3 percent of the nutrients of total milk are used as food, 33.1 percent as feed for animals, and that of skim milk only about one-fifth of the organic nutrients is used as food.

TABLE I—Main Organic Nutrients of Milk: Distribution in the 119,240 Million Pounds of Whole Milk and in the 56,831 Million Pounds of Skim Milk Produced in 1942.

Nutrient	Quantity of organic nutrients in— Whole milk	Skim milk	Distribution of total organic nutrients in— Whole milk	Skim milk
	Million pounds	Million pounds	Percent	Percent
Fat	4,710	57	31.9	0.4
Casein	3,296	1,631	22.2	11.0
Whey protein	1,049	523	7.1	3.5
Lactose	5,747	2,846	38.8	19.2
Total	14,802	5,057	100.0	34.1

TABLE II—Main Organic Nutrients of Milk: Proportion of the Annual Production of These Nutrients in Various Dairy Products, 1942.

Product in which nutrients were utilized	Fat		Casein		Whey protein		Lactose		All four nutrients	
	Million lbs.	Percent	Million lbs.	Percent	Million lbs.	Percent	Million lbs.	Percent	Million lbs.	Percent
Market milk and cream	1,888	40.1	908	27.6	289	27.6	1,587	27.6	4,673	31.6
Butter	1,705	36.2	6	0.2	2	0.2	11	0.2	1,724	11.6
Skim milk and its products	57	1.2	1,631	49.5	523	49.5	2,846	49.5	5,057	34.1
Whole milk cheese	366	7.8	266	8.1	4	0.4	25	0.4	661	4.5
Ice cream	219	4.6	67	2.0	22	2.0	116	2.0	424	2.9
Evaporated whole milk	292	6.2	204	6.2	65	6.2	356	6.2	917	6.2
Sweetened condensed milk	12	0.2	8	0.2	3	0.2	14	0.2	37	0.2
Whole milk powder	16	0.4	13	0.4	4	0.4	23	0.4	56	0.4
Buttermilk and its products	12	0.3	77	2.3	24	2.3	134	2.3	247	1.7
Whey from whole milk cheese	10	0.2	....	....	94	9.0	519	9.0	623	4.2
Whole milk fed to calves	130	2.8	91	2.8	29	2.8	159	2.8	409	2.8
Total	4,707	100.0	3,271	99.3	1,059	100.6	5,790	100.6	14,828	100.2

TABLE III—Main Organic Nutrients of Milk: Proportion of the Annual Production of These Nutrients Present in Skim Milk and Its Products, 1942.

Product in which the nutrients were used	Fat		Casein		Whey protein		Lactose		All four nutrients	
	Million lbs.	Percent	Million lbs.	Percent	Million lbs.	Percent	Million lbs.	Percent	Million lbs.	Percent
Casein (purity 90%)	....	....	38	2.4	....	....	....	....	38	0.8
Casein whey (and wash water)	1.4	2.3	....	....	8	1.5	71	2.5	80	1.6
Condensed and evaporated skim milk	1.7	3.1	50	3.1	16	3.1	87	3.1	155	3.1
Cultured and chocolate milks, etc.	2.0	3.5	57	3.5	18	3.5	100	3.5	177	3.5
Skim milk cheese	1.0	1.8	35	2.2	....	....	....	....	36	0.7
Skim milk cheese whey	1.0	1.8	....	....	10	1.8	53	1.8	64	1.3
Skim milk powder:										
Food	5.8	10.2	166	10.2	53	10.2	289	10.2	513	10.2
Feed	0.6	1.1	18	1.1	6	1.1	31	1.1	56	1.1
Skim milk for feeding directly	43.6	76.6	1,251	76.6	401	76.6	2,183	76.6	3,879	76.6
Total	57.1	100.4	1,615	99.1	510	97.8	2,814	98.8	4,997	98.9

TABLE IV—Main Organic Nutrients of Milk: Proportion of These Nutrients in Whole Milk and in Skim Milk That Was Used as Food and as Feed in 1942.

Source of nutrients, and use	Fat		Casein		Whey protein		Lactose		All four nutrients	
	Million lbs.	Percent	Million lbs.	Percent	Million lbs.	Percent	Million lbs.	Percent	Million lbs.	Percent
Whole milk:										
Used as food	4,509	30.5	1,780	12.0	476	3.2	2,608	17.6	9,373	63.3
Used as feed	191	1.3	1,437	9.7	507	3.4	2,766	18.7	4,901	33.1
Total	4,700	31.8	3,217	21.7	983	6.6	5,374	36.3	14,274	96.4
Skim milk:										
Used as food	11	0.22	308	6.1	87	1.7	476	9.4	881	17.4
Used as feed	44	0.87	1,269	25.1	407	8.0	2,214	43.8	3,934	77.8
Total	55	1.09	1,577	31.2	494	9.7	2,690	53.2	4,815	95.2

Improved Technics for Making Gas-Pack Tests[1]

An improved puncturing device for testing cans both for oxygen content and gas tightness is described. A modified technic of gas analysis and a method of testing cans for gas tightness are presented

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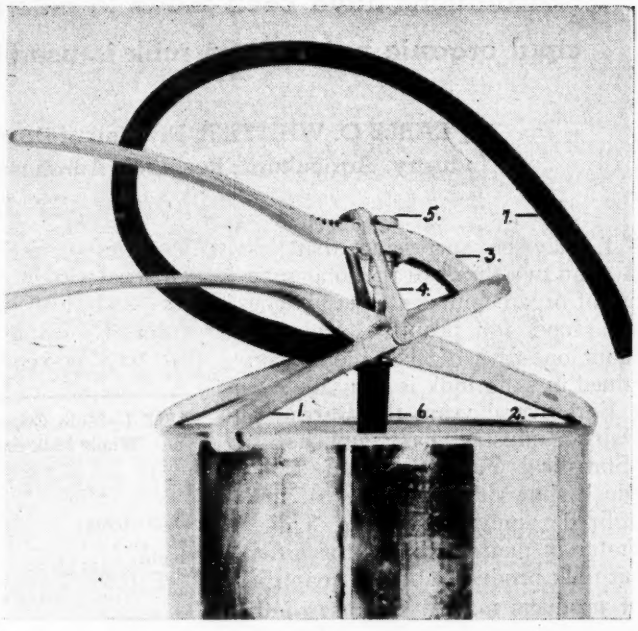

FIG. 1. Puncturing device and method of application. It can be attached to No. 10 can or lid of square 5-gal. can.

IN TESTING cans of gas-packed dehydrated foods for oxygen content and gas tightness, a type of puncturing device which can be fixed securely in position during analysis is desirable. It should be light, portable, easy to apply and should permit immersion of the can in water for testing for leaks. A very convenient and satisfactory type of puncturing device meeting these requirements has been constructed. This device clamps onto a No. 10 closure and presses a hollow needle into the lid. The needle passes through a soft rubber stopper which makes a gas-tight seal. After the puncture has been made, the locking device holds the needle firmly in place.

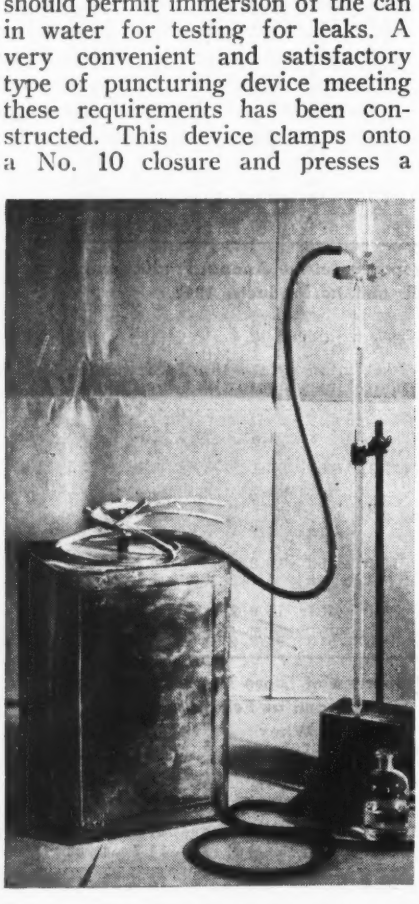

FIG. 2. Arrangement of portable apparatus for analyzing atmosphere in gas-packed cans.

The construction of the apparatus and its method of application are illustrated in Fig. 1. Parts (1), (2) and (3) are forged from 5/16-in. square mild steel. Handles (2) and (3) are slotted to permit the needle (5) to pass freely between them. Clevice (4) is made from 3/16-in. mild steel with a sharp edge on it to engage notches on part (3). The needle (5) is of 3/16-in. diameter with a bore 0.086-in. from the slanting point as far up as the Tee for the rubber tubing (7).

On parts (1) and (2) are strong hooks or claws, which, when under tension, hold firmly onto the under edge of the rolled double seam. This tension also presses the rubber gasket (6) and the hollow needle (5) against the surface of the lid. Holding the device by the handle, the apparatus is in the open position in which the claws are hooked under the rolled edge of the closure. As the handles are pressed together, the can lid is punctured and the rubber gasket is held compressed against its surface. The apparatus can be locked in its puncturing position by swinging the clevice backward along the teeth in the lever. It is important in making the device that a very "flat" angle be maintained between parts (1) and (2) on the side facing the can to insure the proper clamping action.

Method of Gas Analysis

The use of a fixed puncturing device permits of improved technic in the actual gas analysis. The arrangement of the equipment for gas analysis is illustrated in Fig. 2. The method of analysis depends upon transferring a 50-ml. sample of gas to a nitrometer tube and absorbing in turn the carbon dioxide and oxygen by specific chemical solutions. The procedure of analysis is as follows:

Connect the puncturing device with 2/16-in. or 3/16-in. bore rubber tubing direct to the 50-ml. Lunge nitrometer tube. Fill the water-leveling bottle and nitrometer tube with water at room temperature, permitting a few milliliters to pass into the cup at the top. It is important that some liquid (water or reagents) always be left in this cup, as this procedure prevents the possibility of taking in air from the room. Then in carrying out the analysis, puncture the can, clamping the punch in a fixed position. Draw from 10 to 21 ml. of the gas from

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the container into the nitrometer tube by lowering the leveling bottle. Turn the glass stopcock on the nitrometer tube and expel this sample of gas through the inlet cup where the absorbing reagents are added, completely filling the nitrometer tube again with water. This operation clears the apparatus of air. Then take preferably a 50-ml. sample of gas for analysis by lowering the leveling bottle. Smaller samples will do, but the 50-ml. sample permits of maximum accuracy under factory conditions and simplifies calculations. Take in slightly more than 50 ml. Obtain exactly 50 ml. by slowly raising the leveling bottle to the point where the water in the bottle is level with the 50-ml. mark on the tube. Close the stopcock when the water rises in the tube to this mark. When making readings, it is necessary to adjust the internal pressure to atmospheric pressure by having the water surfaces in the leveling bottle and tube equal.

Determine the composition of the gas in the burette by allowing 10- to 15-ml. of 10 percent sodium hydroxide solution to trickle slowly in a thin film down the sides of the tube. The carbon dioxide is absorbed rapidly. When the water level in the tube remains stationary with continued addition of the alkali, all the carbon dioxide is absorbed. After 20 to 30 seconds, make the reading as previously described. This figure subtracted from 50 (when a 50-ml. sample is taken) represents the carbon dioxide present. To convert to percent multiply by 2.

Now add 10 to 15 ml. (or more if necessary) of 5 percent pyrogallic acid in 10 percent sodium hydroxide solution in the same manner as described for estimating carbon dioxide. This reagent absorbs oxygen, the reaction being much slower than the absorption of carbon dioxide. The percent oxygen is ascertained by multiplying by 2 the difference between this reading and the reading obtained for residual gas after removal of carbon dioxide. The unabsorbed gas in the burette is nitrogen. It may be reported as percent by multiplying by 2.

If the product has been gassed with carbon dioxide, the analysis for oxygen may be greatly shortened. Carry out the determination for carbon dioxide. Then, if a 50-ml. sample has been taken, the percent oxygen may be accurately calculated by multiplying the residual volume of gas in milliliters by the factor 0.41. This procedure is possible in products packed in carbon dioxide since the residual gas is composed of nitrogen and oxygen in the same proportion as in air. However, if the product has been packed for several months, it is necessary to complete the analysis for oxygen in order to obtain the most accurate results, since there is often a change in the proportion of nitrogen to oxygen due to changes in the product. When the product has been gassed with nitrogen, it is necessary to complete the analysis employing both absorbing reagents.

After completing each determination the nitrometer and leveling bottle are drained and thoroughly washed by flushing with water. It is advisable to give the nitrometer a final rinse with a few milliliters of dilute sulphuric or hydrochloric acid to remove any traces of alkali. The apparatus may then again be filled with fresh water ready to make another determination. After experience, an operator should be able to make a test in about 10 minutes.

It is recommended that a number of cans be tested for oxygen content every day after having been gas packed approximately 24 hours. This time allows for equalization of the gas within the container. As a double check, it is advisable to analyze a few cans of each day's run after three or four weeks' storage. When first commencing to gas pack, changing to a new product or making a change in operating personnel, it is advisable to analyze several cans following gassing.

Testing Gas Tightness

Cans showing more than 2 percent oxygen should be tested for gas tightness immediately following gas analysis. A simple method of testing cans for gas tightness is illustrated in Fig. 3. A very low pressure of 1 to 1½ lb., or, if no accurate gage or manometer is available, just sufficient to slightly spring the ends of the can outward, is produced in the container by means of a tire pump.

It is desirable to have a manometer for measuring the pressure. An excessive pressure (over 3 lb.) may damage the seams; 1½ lb. is sufficient.

If it is desired, cans could be tested for gas tightness immediately following gassing. In this case, inert gas from the gas cylinder may be used to produce the pressure in the container. It is advisable to insert a small gas-collecting can in the line between the cylinder and the container to avoid possible damage to the container due to excessive pressure. If the number of leakers exceeds 3 percent corrective steps should be taken.

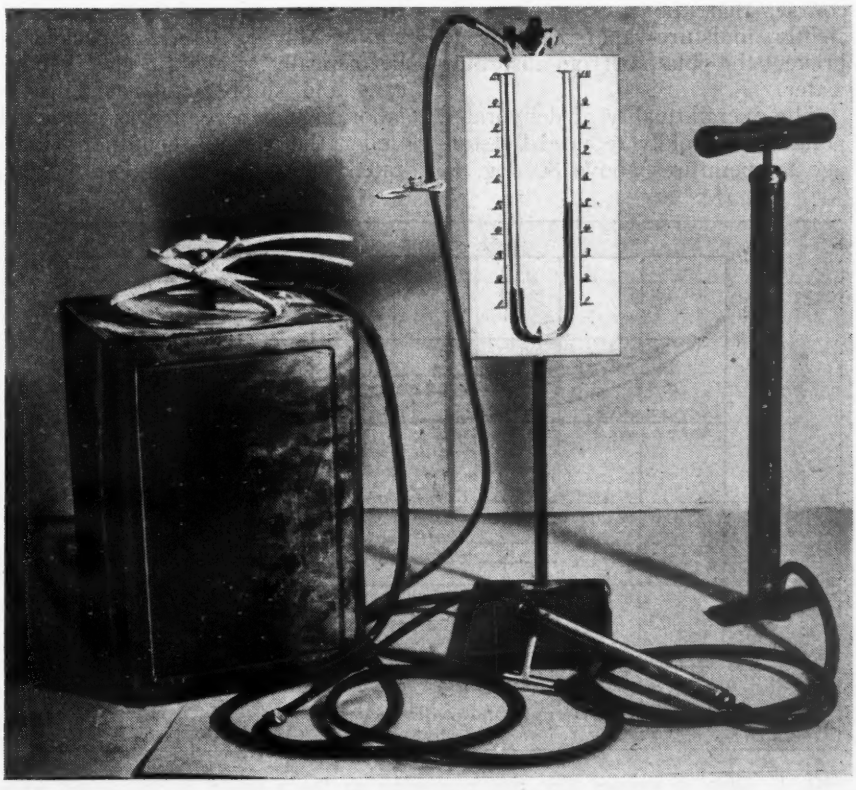


FIG. 3. Arrangement of equipment for testing cans for gas tightness.

New Facts About Packaging And Storing Dehydrated Foods

By MEMBERS OF THE RESEARCH STAFF, Research Laboratories, Continental Can Co., Chicago, Ill.

Delicious mashed potatoes can be made from the dehydrated product. Tests show that dehydrated potatoes are a good source of vitamin C, and they keep for a year if the storage temperature is not over 80 deg. F.

PART XI—DEHYDRATED WHITE POTATOES

DEHYDRATED POTATOES, when properly reconstituted and served as mashed potatoes, are a delicious and attractive food. They are a good source of ascorbic acid (vitamin C) but a poor source of thiamine (vitamin B_1) and riboflavin (vitamin B_2).

They remain in a satisfactory condition during storage periods up to 12 months if stored at temperatures of 80 deg. F. or less. The type of package has little effect on their keeping qualities, provided, of course, that the package is sufficiently moisture-vapor-resistant to prevent the potatoes from absorbing water.

The overall quality of dehydrated potatoes is rapidly reduced by storage temperatures above 80 deg. F. For example, they are no longer passable in flavor after three months at 98 deg. F., while storage at temperatures as high as 130 deg. F. makes them inedible in one month. Therefore, in order to prolong the storage life, they should be kept in a cool place.

These conclusions are based on the results of examinations during one year of storage.

Samples for this experimental pack were secured from the J. R. Simplot Dehydrating Co., Caldwell, Idaho. A portion of the commercial run of May 4, 1943, was packed in hermetically sealed 5-gal. square cans and shipped to our Chicago laboratory, where it was repacked under the various conditions indicated in Part I, FOOD INDUSTRIES, March, 1944, page 63. The potatoes were of the Idaho variety and presumably had been held in storage since late in the fall of 1942. Exact

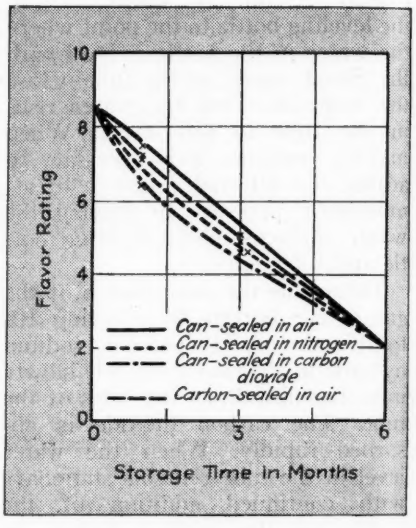


FIG. 2. Effect of storage time and packaging on flavor rating of dehydrated white potatoes stored at 98 deg. F.

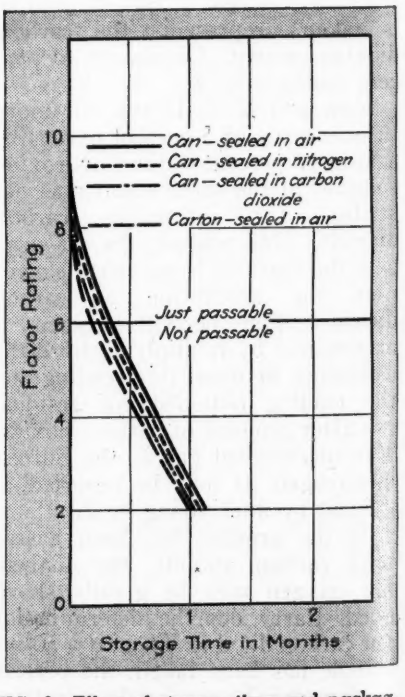


FIG. 3. Effect of storage time and packaging on flavor rating of dehydrated white potatoes stored at 130 deg. F.

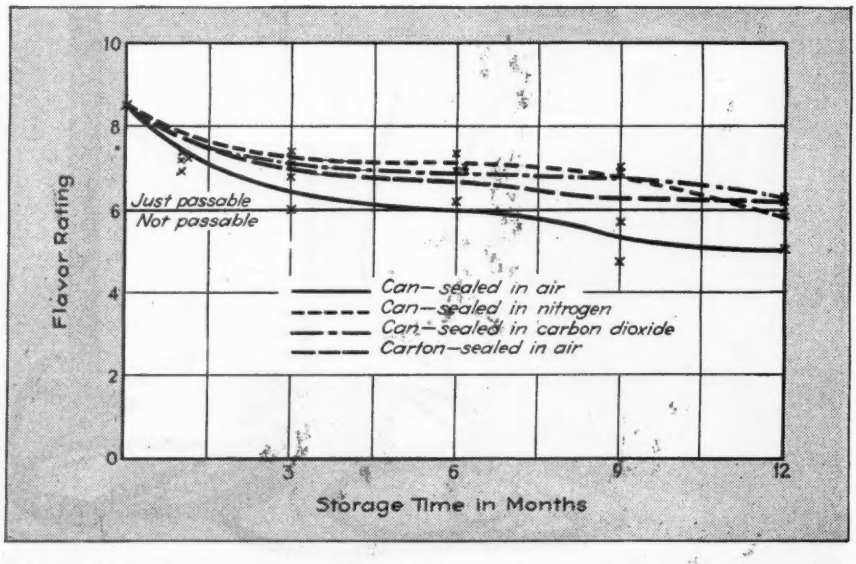


FIG. 1. Effect of storage time and packaging on flavor rating of dehydrated white potatoes stored at 75 to 80 deg. F.

details of the storage conditions are not known.

The potatoes were washed and inspected to remove all those badly diseased and damaged. After this culling, they were given a comparatively short precook and peeled in a continuous-type lye peeler. After being trimmed and cut into Julienne strips, they were blanched in steam at 206 deg. F. for 9½ minutes. The blancher was of a modified hump-

TABLE I—Results of Examinations of White Potatoes Stored at 75 to 80 Deg. F. (Room Temperature).

Storage time	Package	Flavor rating	Drained weight (grams)	Color (dry product) %N-1 (black)	%4R4/16 (red)	%5YR6/12 (orange)	%5Y9/14 (yellow)	%N9.5 (white)	Vitamin content (mg./100 gm.) Thiamine	Riboflavin	Ascorbic acid Reduced	Ascorbic acid Total	pH	Gas analyses %O_2	Gas analyses %CO_2
			Moisture content of product—7.0 percent					Peroxidase activity—negative							
Initial examination	Can—N_2	8.5	46	56	..	13	27	4	0.080	..	21	33	..	0.4	0.0
	Can—CO_2	8.5	46	56	..	13	27	4	..	..	..	..	..	0.4	98.5
1 month	Can—air	7.2	52	54	..	10	26	10	0.057	0.156	19*	31*	..	..	..
	Can—N_2	7.2	50	54	..	13	33	10	0.065	0.164	20*	33*	..	..	..
	Can—CO_2	7.3	50	57	..	12	33	8	0.063	0.160	22*	33*	..	..	..
	Carton	6.9	48	57	..	12	33	8	0.055	0.173	20*	29*	..	..	..
3 months	Can—air	6.0	54	..	..	..	..	..	0.068	0.168	14	18	..	20.7	0.0
	Can—N_2	7.4	46	..	..	..	..	..	0.070	0.180	13	21	..	0.8	0.3
	Can—CO_2	7.1	52	..	..	..	..	..	0.072	0.175	17	30	..	0.6	98.4
	Carton	6.8	52	..	..	..	..	..	0.082	0.181	8	21	..	..	..
6 months	Can—air	6.2	51	54	..	17	26	3	0.058	0.183	6	9	..	18.6	1.4
	Can—N_2	7.4	46	57	..	16	24	3	0.043	0.195	15	30	..	0.3	0.5
	Can—CO_2	7.0	47	56	..	19	23	1	0.053	0.190	10	..	..	0.4	98.2
	Carton	7.0	47	55	..	20	23	1	0.057	0.195	6	17	..	..	..
9 months	Can—air	..	40	47	8	13	32	0	0.046	..	9	22	5.4	19.1	1.3
	Can—N_2	..	48	46	8	10	31	5	0.035	..	11	24	5.5	0.3	0.6
	Can—CO_2	..	49	44	7	7	30	12	0.046	..	11	23	5.5	0.7	98.6
	Carton	..	47	46	8	13	31	2	0.056	..	5	15	5.4	..	..
12 months	Can—air	5.0	49	49	4	4	27	16	0.041	..	13	17	5.6	18.3	1.4
	Can—N_2	5.8	49	44	4	13	31	8	0.046	..	16	23	5.4	0.4	1.6
	Can—CO_2	6.2	49	44	5	19	24	8	0.035	..	14	16	5.4	0.3	99.4
	Carton	6.2	49	46	3	11	31	9	0.041	..	12	15	5.5	..	..

*These values for ascorbic acid were obtained after two months of storage instead of one month.

TABLE II—Results of Examinations of White Potatoes Stored at 98 Deg. F.

Storage time	Package	Flavor rating	Drained weight (grams)	Color (dry product) %N-1 (black)	%4R4/16 (red)	%5YR6/12 (orange)	%5Y9/14 (yellow)	%N9.5 (white)	Vitamin content (mg./100 gm.) Thiamine	Riboflavin	Ascorbic acid Reduced	Ascorbic acid Total	pH	Gas analyses %O_2	Gas analyses %CO_2
			Moisture content of product—7.0 percent					Peroxidase activity—negative							
Initial examination	Can—N_2	8.5	46	56	..	13	27	4	0.080	..	21	33	..	0.4	0.0
	Can—CO_2	8.5	46	56	..	13	27	4	..	..	..	..	..	0.4	98.5
1 month	Can—air	7.5	50	51	..	11	26	12	0.057	..	19*	32*	..	20.3	0.4
	Can—N_2	7.2	48	54	..	18	21	7	0.042	..	19*	30*	..	0.3	0.7
	Can—CO_2	6.4	39	54	..	18	21	7	0.044	..	21*	29*	..	0.3	98.7
	Carton	7.1	48	54	..	11	26	9	0.046	..	21*	33*	..	..	..
3 months	Can—air	4.9	51	..	..	..	..	..	0.059	0.157	13	26	..	19.1	1.2
	Can—N_2	4.6	46	..	..	..	..	..	0.048	0.201	11	21	..	0.4	1.1
	Can—CO_2	4.6	48	..	..	..	..	..	0.044	0.219	18	28	..	0.5	98.3
	Carton	5.0	44	..	..	..	..	..	0.059	0.217	7	18	..	..	..
6 months	Can—air	Inedible	38	66	..	23	7	4	0.035	0.188	13	25	..	18.1	2.3
	Can—N_2	Inedible	38	71	..	27	2	..	0.025	0.202	17	27	..	0.5	3.4
	Can—CO_2	Inedible	38	72	..	28	..	..	0.038	0.212	14	22	..	0.4	97.9
	Carton	Inedible	39	77	..	20	3	..	0.035	0.205	13	23	..	..	..
9 months	Can—air	Inedible	39	59	5	24	12	..	0.043	..	13	25	5.5	17.2	3.3
	Can—N_2	Inedible	39	65	13	17	5	..	0.028	..	13	33	5.2	1.1	4.0
	Can—CO_2	Inedible	40	65	13	17	5	..	0.033	..	10	31	5.3	0.6	98.7
	Carton	Inedible	40	66	9	23	2	..	0.034	..	10	26	5.3	..	..
12 months	Can—air	Inedible	44	58	14	16	10	2	..	..	..	..	5.4	16.4	4.7
	Can—N_2	Inedible	42	61	12	20	5	2	..	..	..	..	5.2	0.3	6.0
	Can—CO_2	Inedible	46	61	13	23	1	2	..	..	..	..	5.2	0.5	99.1
	Carton	Inedible	43	61	10	19	8	2	..	..	..	..	5.2	..	..

*These values for ascorbic acid were obtained after two months of storage instead of one month.

TABLE III—Results of Examinations of White Potatoes Stored at 130 Deg. F.

Storage time	Package	Flavor rating	Drained weight (grams)	Color (dry product) %N-1 (black)	%4R4/16 (red)	%5YR6/12 (orange)	%5Y9/14 (yellow)	%N9.5 (white)	Vitamin content (mg./100 gm.) Thiamine	Riboflavin	Ascorbic acid Reduced	Ascorbic acid Total	Gas analyses %O_2	Gas analyses %CO_2
			Moisture content of product—7.0 percent					Peroxidase activity—negative						
Initial examination	Can—air	..	..	..	..	..	..	..	..	..	..	..	..	..
	Can—N_2	8.5	46	56	..	13	27	4	0.080	..	21	33	0.4	0.0
	Can—CO_2	8.5	46	56	..	13	27	4	..	..	..	..	0.4	98.5
	Carton	..	..	..	..	..	..	..	..	..	..	..	..	..
2 weeks	Can—air	4.7	40	63	1	26	7	3	..	..	19	20	19.7	1.5
	Can—N_2	4.7	37	69	1	26	1	3	..	..	21	28	0.3	1.4
	Can—CO_2	4.7	41	69	1	26	1	3	..	..	22	23	0.5	98.6
	Carton	4.7	40	69	1	25	2	3	..	..	21	22	..	..
1 month	Can—air	Inedible	37	72	..	23	1	4	0.024	0.164	..	..	18.8	4.2
	Can—N_2	Inedible	35	86	2	11	..	1	0.026	0.176	..	..	0.5	6.1
	Can—CO_2	Inedible	38	83	3	13	..	1	0.026	0.170	..	..	0.6	98.5
	Carton	Inedible	38	83	3	13	..	1	0.045	0.179	..	..	..	..
2 months	Can—air	Inedible	38	82	5	13	..	..	..	..	20	29	15.4	11.6
	Can—N_2	Inedible	39	82	6	12	..	..	..	..	19	34	..	..
	Can—CO_2	Inedible	39	85	5	10	..	..	..	..	24	29	0.5	98.8
	Carton	Inedible	40	91	1	8	..	..	..	..	20	26	..	..
3 months	Can—air	Inedible	..	84	3	11	..	2	0.019	0.180	..	..	13.1	15.6
	Can—N_2	Inedible	..	93	2	4	..	1	0.017	0.187	..	..	0.2	9.8
	Can—CO_2	Inedible	..	94	2	3	..	1	0.024	0.179	..	..	0.2	98.6
	Carton	Inedible	..	92	2	5	..	1	0.015	0.185	..	..	..	..

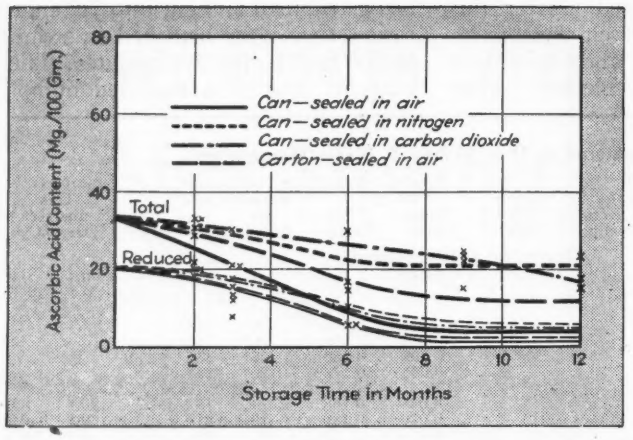


FIG. 4. Effect of storage time and packaging on total and reduced ascorbic acid content of dehydrated white potatoes stored at 75 to 80 deg. F.

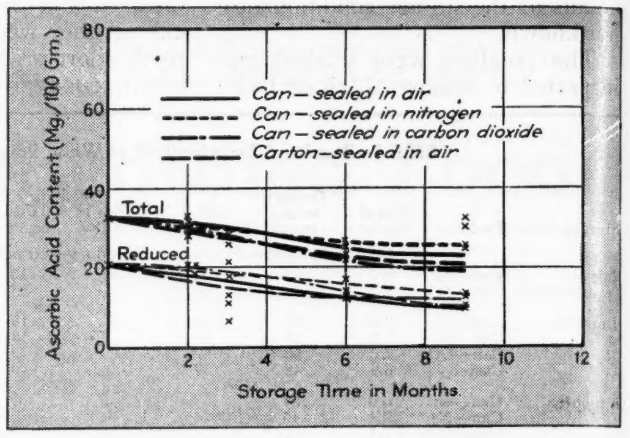


FIG. 5. Effect of storage time and packaging on total and reduced ascorbic acid content of dehydrated white potatoes stored at 98 deg. F.

type design. The dehydration unit itself was of the Pucinelli type with direct oil fire. The drying time was approximately 8 hours at 150 deg. F. dry bulb and 100 deg. F. wet bulb.

Modifications of the regular examination procedures made in the course of this experiment were as follows:

1. Because of the delay in transit from Caldwell, Idaho, to Chicago, there was a lapse of nine days between the time the product was dehydrated and packed under the conditions specified.

2. Reconstitution: All flavor tests and drained weights were made on cooked mashed potatoes prepared from samples according to the following formula: 40 grams of dehydrated Julienne style potatoes was added to 300 c.c. of water. The mixture was allowed to stand at room temperature for one hour, brought to a boil (requires about 10 minutes), and simmered for 30 minutes. Then 10 c.c. of milk and 5 c.c. of butter were added and the product mashed thoroughly with a fork. The drained weight data reported on the basis of 10 grams of dehydrated potatoes.

3. Because the product stored at 130 deg. F. deteriorated so rapidly, examinations of these samples were discontinued after three months of storage.

Summary of Results

1. *Effect of Packaging*—At some of the later examinations, the flavor retention seemed to be better in the gas-packed cans and in the carton than in the air-packed can. An additional examination was, therefore, made after 16 months of storage at room temperature. This later examination failed to confirm the preference for gas-packing.

The color retention was found to be better in the air-packed can and in the carton than in the gas-packed cans. The gas-packed sample showed a greater tendency to develop a reddish color, particularly at the later examinations.

There were no appreciable differences in thiamine or riboflavin retention between the samples in the various packages stored at the same temperature. However, there was a slightly greater retention of ascorbic acid in the gas-packed product as compared with that sealed in air. There was no evident difference between those hermetically sealed in air and those in the paper packages.

There was no significant absorption of moisture by the product in the paper packages even when stored

(*Turn to page* 149)

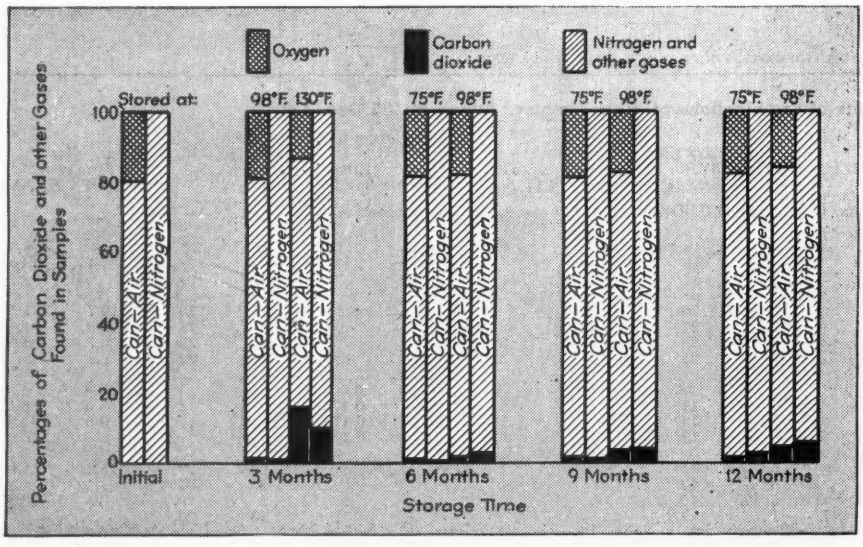


FIG. 6. Effect of storage time and temperature on evolution of CO_2 by dehydrated white potatoes packed in air and in nitrogen.

TABLE IV—Results of Periodic Weighings of Dehydrated White Potatoes Packed in Cartons Stored at 98 Deg. F. and 93 Percent Relative Humidity.

Storage time	Number of samples weighed	Average percent increase in product weight over original*
Initial examination	24	..
1 month	22	0.34
3 months	22	0.42
6 months	18	0.09
12 months	13	0.26

*These figures are corrected for the weight of water absorbed by the paper in the container (4 percent increase in container weight in 5 days).

TABLE V—Results of Periodic Moisture Determinations on Dehydrated White Potatoes.

Storage time	Storage temp. (deg. F.)	Package	Moisture content (% of total wt.)
Initial examination	....	.....	7.0
1 month	98*	Carton	6.8
3 months	98*	Carton	6.6
6 months	98	Can—air	5.9
	98	Can—N_2	6.7
	98*	Carton	7.1
	75–80	Can—air	6.2
	75–80	Can—N_2	7.0
	75–80	Carton	6.7
9 months	98	Can—air	6.6
	98	Can—N_2	6.9
	98*	Carton	7.3
	75–80	Can—air	6.4
	75–80	Can—N_2	7.2
	75–80	Carton	7.2
12 months	98	Can—air	6.1
	98	Can—N_2	6.9
	98*	Carton	7.3
	75–80	Can—air	6.0
	75–80	Can—N_2	6.7
	75–80	Carton	6.8

*The paper packages stored at 98 deg. F. were also subjected to a relative humidity of 93 percent.

EDITORIALS

LAURENCE V. BURTON, Editor

Meaning of the Election

THE great indoor sport of the past month is interpreting the Presidential election in terms of probable future events. The closeness of the popular vote deprives the "mandate" —as some call it—of a clear-cut character. But, in general, it appears to be the will of the majority to support the President in a foreign policy that will be the opposite of isolationism. The United States is to take a much larger part in world affairs than in decades past. Thinking people are convinced more than ever that world stability and peace must be predicated on whole-hearted cooperation of the United States.

We wonder, however, if this cooperation is to be real, or if it will be only a gesture? It is possible easily to offset much of the good of the Dumbarton Oaks plan of world policing power by economic attitudes that will lead to international strife. If the international viewpoint is to be adopted, it implies policies that will encourage foreign trade, for as Secretary Hull has long contended, unless there is foreign trade there will be trouble. But to encourage foreign trade also implies reduction of the barriers known as tariffs. The technics of such reductions are of less moment than the fact of their accomplishment.

The big question seems to be whether the body politic will have developed in mental stature to the point where it will support this, or any other, administration in a concerted effort to increase world trade. It seems almost too much to expect industry, agriculture and labor—which have long enjoyed tariff protection—to relinquish a part of it in exchange for a larger volume of business. Nevertheless, if the election is correctly interpretable as a mandate to go along in this direction, then the barriers to foreign trade must be lowered. We cannot sell without also buying.

To employ our military forces in the postwar period to police any aggresor will be to deal only with symptoms. The real cause of future wars will have their roots, as always, in economic problems.

Performance Specifications The Processor's Job

PERFORMANCE specifications set up by government purchasing agencies for packages for war supplies have had an important effect in advancing knowledge of packaging, it was made clear at a recent meeting of the Packaging Institute. These specifications had to be met. The buying agency did not tell *how* they should be met; it merely told *what* performance was demanded. It was then up to the seller to meet the specifications. The Air Corps, it is true, went so far as to give a list of approved suppliers of moisture-proof wrappings merely to conserve endless weeks of tests, but the names on the list were merely those who had demonstrated that they could meet the performance specification. In time of extreme urgency such aid has been very beneficial to those who have had little previous experience with protective packaging for adverse conditions. It cannot be said, however, that the food processing industry has lacked problems of packaging to meet all sorts of conditions.

The government's experience in packaging during wartime should be an important example, to all food manufacturers, of a very important approach to the peacetime packaging problems. Most important of all is the fact that the government *buying agency determined in advance exactly what sort of performance was needed.* Do food manufacturers often do likewise? Not often enough to be noticeable.

Too often the food manufacturer waits until some supplier seeking business comes around and studies out his problem for him. The supplier finally learns what the problem is and the performance needed to cope with it, sells the food company the new material, or new package, and we call it progress.

In a sense it is progress, but it is not conscious progress. To sit on one's tail awaiting someone to come along with an improvement is not our idea of getting somewhere. The task of knowing exactly what the problems are is nobody's but the food processor's. If he has not the gumption to have his own packaging laboratory to determine what is needed in the way of performance, then he is in a fair way to be left behind when there is a wild scramble for business.

Another change from current ways will be forced when peacetime comes again. Government specifications are for performance under the most extreme conditions to be met anywhere. Much of the packaging for such conditions is too costly for peacetime, and, furthermore, is not needed. It is important to know not only what conditions must be met but what need not be done. A common error of business is to permit the setting of specifications that are needlessly rigorous and costly, when lesser performance would effect an economy, yet would be adequate. To determine the latter is another function of the packaging laboratory.

The art of protective packaging has been greatly advanced by the war. It is up to each manufacturer to utilize as much of the advance as is economically justified.

Sign of the Times

IT has taken the upheaval of war to bring about the sort of thing advocated by FOOD INDUSTRIES many years ago. In the depths of the depression it was pointed out that food manufacturers would do well to seek higher value products to be made out of their raw materials. In the ten or twelve years that have ensued, many a firm has done just that.

Postwar planning has had much to do with the decisions to add or get into other lines. As one executive put it: "The characteristics of our own postwar activities are that we shall be getting into businesses that were none of our business in days gone by. I think this generalization will typify the activities of many other firms as well."

Without any pretense at making a survey, we record a few cases that come to mind, cases where the connection between old and new activities is none too obvious:

National Distilleries has acquired White Rock Mineral Water.

Burry Biscuit Co. has expanded into cleaning, polishing and oral hygiene products by the formation of Poly Clene Co., Inc., and Lucident Co., Inc.

Heinz Co. is making airplane fuselages.

New England Confectionery Co. is manufacturing radio parts.

General Mills is making fire-control apparatus and metal household appliances.

American Home Products Co. has entered into the manufacture of many foods in a big way.

Corn Products Refining Co. and Armour & Co. have gone into the manufacture of chemicals.

Quaker Oats Co. has been making furfural for a great many years.

Glenn L. Martin Co. (aircraft) has bought a local food packing plant in Chesterton, Md.

Curtis Candy Co. now produces dehydrated soups, as well as sauces, potato chips and chewing gum.

Universal Match Co. now owns Schutter Candy Co.

And Peter Fox Brewing Co. has sidelines of poultry, eggs and oil wells.

We are glad to see these new developments, even though some of them will scarcely outlast the war. Anything that serves to elevate the food industry from a business where only the heritage of centuries of prior art is needed to enter it, to a field of activity where technical education is indispensable, will be good for the industry.

Defense Research Must Not Stop

OFFICE of Scientific Research and Development is the name applied to the research organization set up by the government to manage the research carried out for the benefit of the armed forces. It has the job of farming out the research projects to suitable laboratories and paying for the work out of its budget, which amounts to more than $70,000,000 a year. The setup now in existence under the able direction of Dr. Vannevar Bush is probably the finest research organization in the world. But not until the war is over will the public be told much about its affairs. Perhaps some of its activities will be forever kept secret.

Because it was an improvised organization, it probably will be disbanded as soon as the shooting is over. This would be a great mistake. Whether it be called by the same name or some other, it should be retained and be kept at research that will help this country to be more ready than we were in 1941. When the next war starts, it is very doubtful that any other nation will stand between us and the attacker while we are frantically trying to get ready. While it is true that OSRD has not done anything directly for the food processing industry, we are all citizens and all have a stake in the welfare of the land. Congress will usually appropriate the money for worthwhile objectives, provided there is adequate public support for the action. For this reason the OSRD is brought to your attention.

Yet there is another matter in connection with the foregoing that should be considered at the same time. Forward-thinking men fear that the wild scramble for research workers in the postwar years will result in raids on our universities to such an extent that the creation of new researchers will be impeded seriously, if not almost stopped. Top-quality research men are now being offered jobs by industry with $10,000 a year as a starting figure. What university can compete with such a salary scale? And if our universities are depleted of their teachers of research methods, then where will the country be when the next war hits us? It appears feasible that OSRD or some successor organization might be the means of giving these top-notch university trainers of research workers enough money to stick on the job. The whole country will benefit, if it can be worked out along some such line.

Where Are the New Food Plants?

THE nearest thing to a postwar design for a food plant was the new plant of Gelatin Products Co., Detroit, in a group of seven new plants portrayed in a recent issue of *Architectural Record*. But this plant makes and fills gelatin capsules. All the other plants were farther removed from food than pharmaceuticals.

Stupidity Exemplified

If you can get a feeling of superiority from reading about stupidity, you will enjoy reading the *Annual Reports* 1941-1942; 1942-1943 of the Food and Drug Administration, which have appeared in a single 57-page pamphlet.

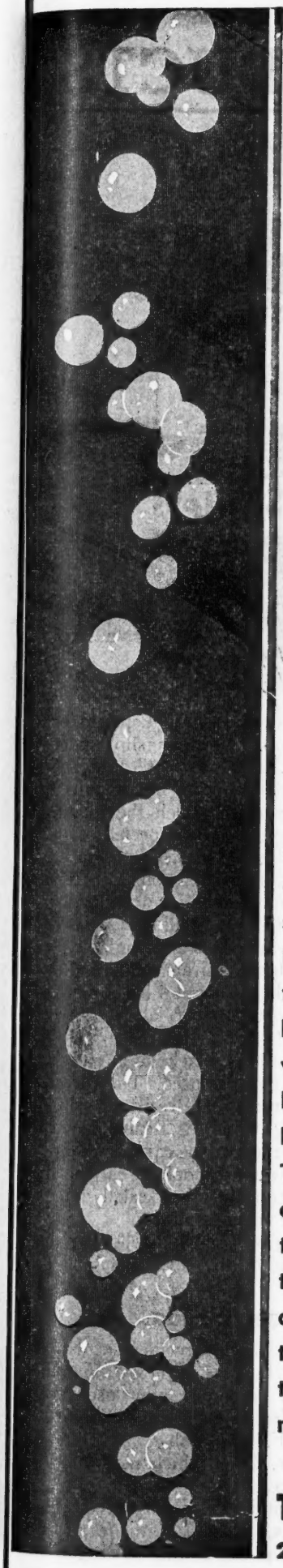
There is the story of the baker who "aged" his flour under insanitary conditions and was aware of a heavy infestation of weevils, but believed that sifting the flour would remove the contamination. Sadly he has learned that samples of his bread made from the sifted flour, collected at nearby interstate points, were all found to contain insect fragments (p. 20).

Then there were the confectioners who reused their starch so long that it was full of rodent hairs and excreta (p. 21).

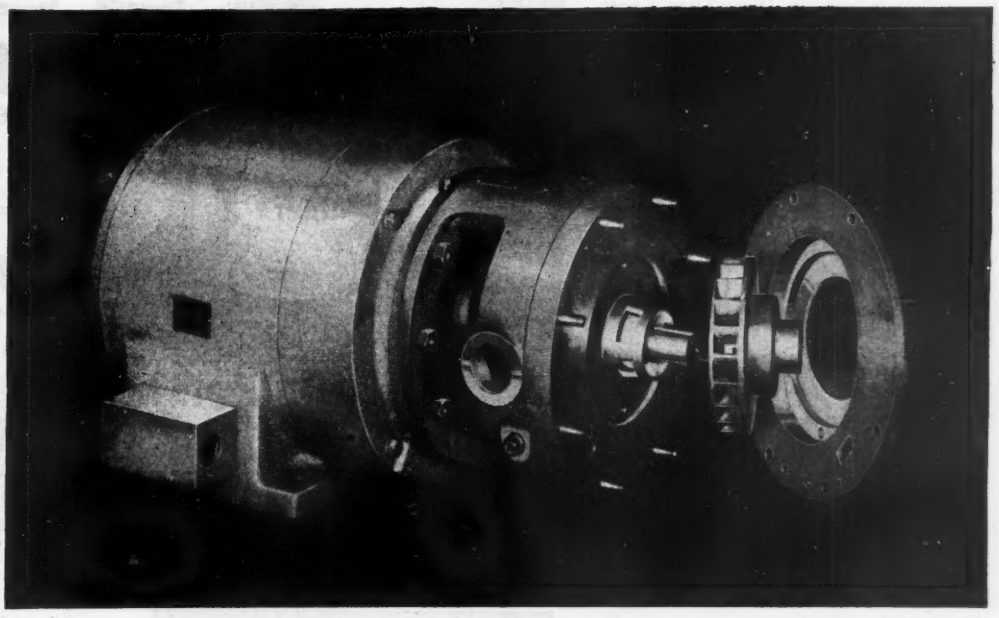
Makers of butter or creamery spreads containing only 30 to 70 percent of butterfat in the face of a Federal statute requiring 80 percent also got a going over (p. 32). Ditto for a product called "green tea" that was dried grass resembling lawn grass; and for importers who brought in chocolate from Cuba without critical attention to labeling and composition, later being informed by Food and Drug officials that the product was adulterated with starch and cocoa (p. 33). Also ditto for canned sardines labeled as packed in pure olive oil that proved to be corn oil ($5,000 fine); oysters that had been given quite a drink of fresh water; "enriched" bread that contained no enriching ingredients.

Among the choicer bits is the fine for the confectioner whose 5½x3½ x1-in. package contained four wrapped kisses and a cheap prize—all occupying not more than a fraction of the space in the box. Notable also is the packer of pitted dates who left empty spaces in the bottom layers (p. 34).

Some day some of these gentry will learn that there are food laws with teeth, and that it takes gumption and a sense of cleanliness to keep house in a factory. While we are inclined to be sympathetic with the man who is merely ignorant, there is no excuse for filth and stupidity. The law is plain. The food industry would be greatly benefited by their exit.



ONLY CLEAN AIR CAN REACH YOUR PRODUCT FROM A NASH COMPRESSOR



Here is a compressor designed perfectly to meet the needs of the Food Plants. It is simple, for it has only one moving part, a rotor cast in one piece and rotating in the casing without metallic contact. This means trouble-free operation over long periods. It is compact and requires little valuable floor space. Its oversize ball bearings seldom require attention or lubrication. No lubrication is required in the interior, so that the air is kept clean from the time it enters the pump. • But this is not all. The compressing medium in the Nash Pump is a rotating column of clean water. The air is in intimate contact with this water in passing thru the pump and is actually scrubbed while it is being compressed. Dust present in the atmosphere is removed, and the air delivered free from dirt, oil, or heat, without the use of scrubbers or air washers. Think what this means in terms of purchase cost and floor space occupied by complicated air washing apparatus. • These pumps are proving their worth in the most trying service. They are ideal for transferring beer or wort from tank to tank by air pressure, for maintaining pressure on aging tanks, for supplying compressed air to bottling machines in racking, etc. • Available in any capacity, these pumps deliver pressures up to 40 lbs. absolutely uniform without storage tanks. • You want the most reliable pumping equipment in your plant, so by all means find out more about the Hytor. Our catalog No. 217 is free on request.

THE NASH ENGINEERING COMPANY

243 WILSON ROAD • SOUTH NORWALK, CONNECTICUT

NEW PACKAGES & PRODUCTS

Gay Can Labels

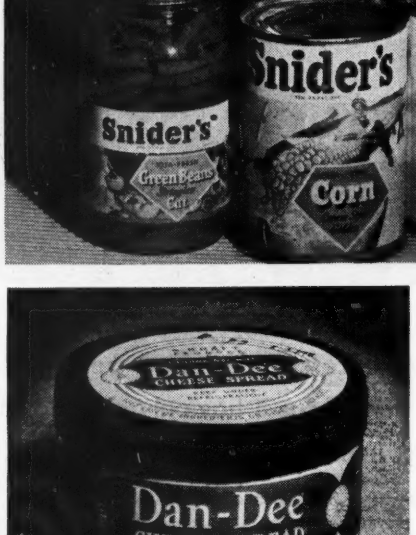
LABEL redesign with an eye to post-war markets has been decided upon by Birdseye-Snider, Inc., New York, for an entire line of products in glass and tin. Bright colors are used. Design features common to all the labels are the use of a white band at the top bearing the name Snider's in red; below this the label has a yellow background with a fanciful picture of the product and a set of equally fanciful characters now being made familiar to the public in advertising as the "Snider Folks."

On the glass packs, the label is placed as low as possible, to show the contents above it.

The labels for the processed vegetables in glass carry data on the quantity in terms of pieces (beets) or cups (beans), and the number of servings to be obtained from one jar. The can labels have this information and a panel bearing suggestions for serving.

Cheese Spread

DAN-DEE Cheese Spread is described as a dairy product composed of American Cheddar cheese and a Roquefort-type cheese made in the U. S. A. from cow's milk. These are combined with nonfat milk solids, whey concentrate, sodium phosphate, salt, cream and lactic acid. The spread contains 26 percent milk fat and 44 percent moisture.



The spread must be kept under refrigeration. A paper slip under the cover bears the note that the quality and flavor are not impaired by surface mold, which the manufacturer says is to be expected.

Kraft Cheese Co., Chicago, packs this spread in 1-lb. cartons, at present distributed only in one or two areas. Distribution will be increased as soon as materials are available.

The carton is spiral-wound and is 2½ in. high and about 4 in. in diameter. A coated paper label is used as a tightwrap around the sides. The bottom is blackplate, and a paper slip cover is used. The cheese is placed in a grease-resistant cellophane bag which is sealed down around the top of the carton. A circle of the same cellophane is placed over the top and also sealed down before the cover is put on.

Printing is in red and yellow, with the outside of the cover black.

For Frozen Foods

STRUCTURAL reinforcement to withstand stacking is achieved in the Frigi-Pak container now used by several West Coast freezers. Among these is F. G. Lamb Co., Milton-Freewater, Ore., which uses it for apple slices.

The container is a two-piece telescope box, each part made of a single strip of B-flute corrugated

fiber, folded in such a way that the ends require no adhesive or stitching.

The extra fold of fiberboard across the top at each end not only provides strength but insures air circulation when the boxes are stacked. The weight is taken on folded, rather than cut, edges of the board.

For 30-lb. bulk shipment, the box is made 20 by 10 in., with an inside depth of 4½ in. This gives a maximum freezing depth of between 2 and 2½ in. in the food, and the box is convenient for filling and handling. A heat-sealed cellophane liner, formed over a mandrel, is used.

New Zealand Cans

CASTLE ROCK Mussel Soup and New Zealand Yellowtail are typical of the foods now being packed and distributed "Down Under," as a result of wartime demands. The mussel soup is made from deep sea mussels (Kutai) from the Hauraki Gulf, by the Hauraki Packing Co., Coromandel, N. Z.

The yellowtail of Australia and

New Zealand resembles the amberfish (*Seriola dorsalis*) of our California coast. It is packed by Seafoods, Ltd., Auckland, N. Z.

Both products are packed 15 oz., net weight, to a can.

The labels are printed on unglazed paper, that for the mussel soup in red and white with bold blue accents and that for the yellowtail in black on an amber paper.

Candy Carton

SPEARMINT JELLIES, sold under the name of Ridley's Spearmint Leaves, are a quality product of Metro Chocolate Co., Brooklyn, N. Y. They are packed in a simple folding carton, which contains 1¾ oz., for candy-counter distribution. Since the

product requires little protection except from dirt, a wax paper wrap is used inside the carton.

The label recently has been restyled, the new design making effective use of four colors. A yellow band across the top, with a good color reproduction of the green candies against a dark blue at the bottom, makes an attractive alternation of color values when the packages are put in racks on the retail-store counter.

Synthetic Chicken Fat

IN the widespread attention to the scarcity of butter, the lack of other cooking fats is sometimes overlooked. Chicken fat is used in cooking and as a spread by a large part of our population of central European origin. Chicken fat, too, has been scarce.

Chikay, a new product made and distributed by Cosmo Packing Co., New York, can be used anywhere that chicken fat is used. It has a vegetable oil base, flavored with carrot and a trace of onion.

Half-pound, 1-lb. and 2-lb. standard jars are packed. Black-plate screw caps with an oil resistant liner are satisfactory. The small label is in yellow, red and black.

At present on a test-market basis, wide distribution is expected soon.

Synthetic Cinnamon

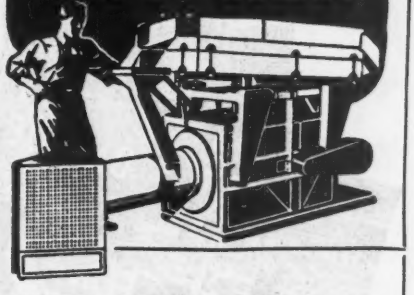
SYNTHETIC SPICES for bakery use have been greatly improved recently. The new synthetic cinnamon which has been put on the market by Atlantic Processing Mills, New York, has both texture and flavor so close to the natural spice that it is expected to continue in use even when the natural spice again becomes available. There is a considerable price differential in its favor.

At present the synthetic cinnamon is distributed only in 50-lb. crinkled-kraft-lined wood drums. When materials and machinery are available, retail distribution will be undertaken.

Take the $$$$$$$ out of $tone$

• Now, with critical war shortage of labor, streamline STONING in your mill. Removing stones has always been slow, laborious and costly out of proportion to other steps in processing cereals, soy beans, and other dry foods. To eliminate this great headache of the cereal and other dry food processors, we have developed a new type stoner—revolutionary in design, amazing in efficiency, low in first cost, in operation. Removes stones, glass, non-magnetic metals, and all other hard, dangerous contaminations from cereals, soybeans, and other beans, and other food products, with, 1) an action so sensitive the tiniest particles are easily removed; and 2) operating cost so low it is relatively insignificant; and 3) 99.9% efficiency. Capacity up to 16 tons per hour. **Write for Bulletin FI-1244.**

SS&S AIR-FLOAT STONER



SUTTON, STEELE & STEELE, Inc.
DALLAS, TEXAS
In Canada—Kip Kelly, Ltd., 68 Higgins Ave., Winnipeg
Foreign — Separations Engineering, Ltd., 133 Bush House, Aldwych, London

B_1 IS OFF ALLOCATION!

Now vitamin B_1 as well as B_2 can be shipped in any quantity, for immediate delivery at any time, with *no* allocation worry of any kind.

The War Production Board's announcement of October 21 dropping vitamin B_1 (thiamine hydrochloride) from allocation, follows recent similar action on B_2 (riboflavin) and means that once more—for the first time in many months—all customers, likewise all who have been holding off regular use of these vitamins because of restrictions, can go "full speed ahead" and be sure of adequate supplies for every desired purpose.

As a world's leading maker of these vitamins, we were naturally looked to for huge increases in production. But this would not have been possible without the untiring efforts of the men and many women who have kept our manufacturing units operating day and night, turning out Vitamins By The Tons for America and her allies. Like the rest of our 1600 employees who have maintained the heavy flow of Roche products—vitamins, medicines, penicillin—required for military and civilian health defense, they have done their jobs well.

For latest prices covering any prospective use—or increased use—of vitamins B_1 or B_2—also B_6, C, E, calcium pantothenate, niacin or niacinamide—keep in touch with our Vitamin Division. Whatever quantity you need, *whenever* you order, you can depend on getting finest quality in its most advantageous form if you specify 'Roche.'

HOFFMANN-LA ROCHE, INC.
VITAMIN DIVISION NUTLEY 10, N. J.

FOOD INDUSTRY NEWS

DEVELOPMENTS IN DISTRIBUTION

Recent Sales of Government-owned Food Stocks Show Disposal Pattern

Brokers have been employed so far only in the sale of odds and ends left by abandoned military posts

FIVE MONTHS' sales of government-owned foods, which have amounted to over $23,000,000, give a pattern of how these sales are handled and the reasons behind the sales. It is WFA's official policy, as enunciated by Lee Marshall, that when the need for certain food no longer exists it is to be released promptly for civilian use. The causes for surpluses and changing requirements are as varied as the items that have been sold.

Government-owned food being sold by WFA is first offered to the original processors. Remaining quantities are then offered to processors of the same or like commodities. Anything that is not sold to processors is then offered to wholesale distributors and chain stores. Jobbers are used in the distribution of odd lots.

An offering of 391,214 cases of canned corn, announced last April, was one of the first and one of the largest to be made. All but 138,500 cases were sold to the original processors. This amount was again offered to all processors and about 116,000 cases remained unsold, which has since been offered and is now about all cleaned up. There is a suspicion that some of the processors did not accept the offerings because they felt that the corn could be purchased later at a price below the ceiling. This did not occur, and as long as the present sellers' market exists the government will not have to take a loss to move its surplus foodstuffs.

Dried fruits also represent one of the largest items of processed food to be returned to the civilian market. In this group, a quantity of raisins not in condition for sale on the domestic market was offered to the wineries. All apricots and prunes, however, were taken up by the original processors, as well as 75 percent of the dried peaches. Twenty-five percent of the latter went to competitors.

One of the real problems of WFA is the disposal of foods that have been purchased to support farm prices in accordance with the Steagle amendment. Eggs fall in this category, and at the present time there is a tremendous stock of dried eggs and shell eggs that will have to be moved. The domestic market is not a good outlet for dried eggs or even for storage eggs with so many fresh eggs available. Dried eggs will probably have to be disposed of outside of the country.

A quantity of old potatoes that was purchased to support the price has been dried and sold for livestock feed.

Among the dairy products, dried milk is not on hand in excess quantities. As time goes on it becomes apparent that spray dried is the more desirable product and that roller dried milk is not being called for. Some butter is being disposed of that is at least not high enough grade to be shipped overseas.

Among the many food items that have been sold at surplus stocks was 3,000,000 lb. of beef. This meat was in transit to eastern ports or had already arrived at the seaboard when the invasion of Europe began. No ships were available and since it appeared that the meat could be replaced in day-to-day operations the 3,000,000 lb. became a windfall for the civilian market.

There is an increasing number of odd-lots that are being sold, amounting, perhaps, to one carcass and a few pounds of this or that. These odd lots occur when military posts are closed and there is not enough involved to pay for having it transported elsewhere. Distribution of such food items is being made through the brokers, and this probably will be the main use of the services of brokers in the distribution of surplus foods. One recent sale included four cans of tongue, twelve barrels of tails and seven cans of link sausage.

One type of government transaction which the daily press does not seem to understand is the sale of a product in one locality and the purchase of the same grade and quantity some place else. Recent transactions of this character occurred when sales on the Pacific coast were balanced by

Press Association

WIND RUINS LARGE CITRUS CROP

The damage to the Florida grapefruit and orange crop, by the hurricane of October 19, proved to be worse than was at first anticipated. A government survey indicates that production of Florida grapefruit has been cut 43 percent and the orange output is reduced 10,000,000 boxes under October 1 estimates. Despite this loss the Department of Agriculture estimates only a 6 percent drop in the Nation's citrus crop for 1944-45.

purchases on the Atlantic coast. Obviously, this operation was made to save the cost of freight and also the use of badly needed transportation equipment.

Other occasions when the government is simultaneously selling and purchasing approximately the same grade and quantity of a particular item occur in the normal process of disposing of old stocks to prevent spoilage and replacing them with fresh.

Analysis of the five months' operations reveals that 92 percent of the canned vegetables have been resold to processors, 5 percent to wholesalers and 3 percent to chain stores. In some cases the processors involved were owned by chain stores.

Of the dried fruit disposed of by the government, 73 percent went back to the processors, 25 percent to industrial users—raisins that went to the wineries—and 2 percent was sold to jobbers. The last item was two carloads of dried apples.

The excess quantities of condensed milk that the government has been giving away has now been disposed of almost entirely. Heavy submarine sinkings early in the war were the cause of the pile-up. Prior to that time it had been decided that England's milk shortages would be made up by the shipment of condensed milk from this country, and our industry was geared up to produce the milk. Shipping losses and extreme shortage of space necessitated a change from condensed milk to powdered milk. Before production of condensed milk could be stopped and the necessary equipment to produce the dried milk installed, a great surplus of condensed milk piled up in government warehouses.

The dry peas that were disposed of recently were accumulated as a result of the government's price support program. These peas were left over from canning operations. They are unsuitable for human food and are now being sold for animal feed.

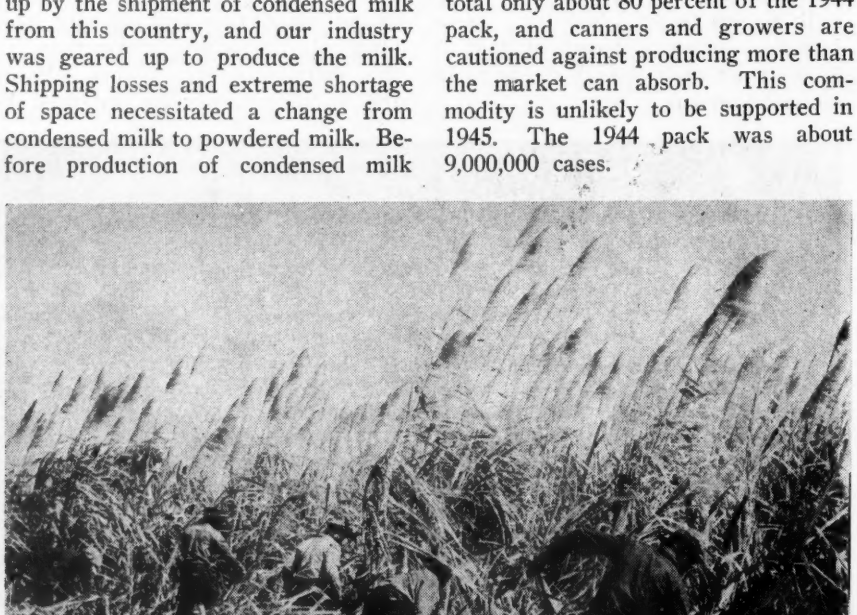
WFA Creates Office For Surplus Property

THE War Food Administration has established a new staff office to supervise and coordinate the functions of its various agencies in surplus property disposal, reconversion and contract settlement.

David Meeker was named director of the new Office of Surplus Property and Reconversion. He has been serving as Chief of the Farm Machinery and Supplies Branch of the Office of Materials and Facilities, a WFA staff office.

Spinach Needs Lower

WFA has announced that tentative spinach requirements in 1945 for U. S. civilians and military services will total only about 80 percent of the 1944 pack, and canners and growers are cautioned against producing more than the market can absorb. This commodity is unlikely to be supported in 1945. The 1944 pack was about 9,000,000 cases.



Wide World

SUGAR FROM THE FLORIDA EVERGLADES

With the country needing all the sugar it can get, these workers in the Florida Everglades are busy cutting down the cane prior to shipment to the sugar house for grinding. The United States Sugar Corp. alone has 30,000 acres under cultivation in this area.

Institute Outlines Peacetime Packaging

BETTER use of familiar materials, rather than a sudden change to new and entirely different ones, will characterize postwar packaging, according to the speakers at the Packaging Institute meeting in New York, November 1 and 2.

Development of wartime government specifications based on performance has permitted advances in packaging technique, according to P. M. Gilfillan, of Shellmar Products Co. In order to continue these technical advances the packaging industry must develop suitable performance specifications for peacetime packages. Efficient packaging lines must provide flexibility, interchangeable units, streamlining for appearance and cleanliness, dust control where necessary and automatic lubrication, in the opinion of Glenn E. Truax, of Peter Cailler Kohler Swiss Chocolate Co., Inc. Packaging lines should be designed to operate at slower speeds when breaking in new employees or when there is a delay in production at other points. In the discussion it was brought out that the manufacturers can supply all of these features, but that the initial cost is frequently more than the industry is willing to pay.

More Powdered Milk Should be Available

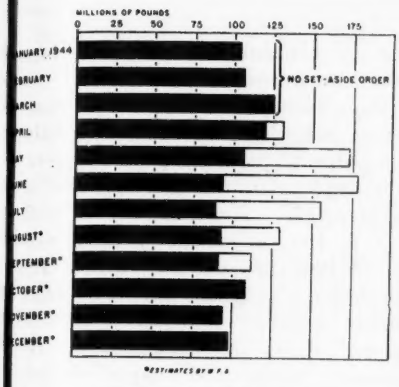
MANUFACTURERS of soups, ice cream, bakery foods and other users of powdered milk will benefit by the decreased set-aside quotas and present sizeable inventories. Set-aside requirements for spray dried skim milk were lowered by WFA from 50 percent of production in October to 40 percent of production in November. WFA policy is to buy less during the period of low milk production. No set-aside quota on roller dried skim milk has been in effect since the first of September.

Apple Juice Increase

GREATLY increased production and sale of apple juice in Canada are expected after the war, according to the Department of Commerce.

Production of apple juice increased to 407,193 cases in 1940 but since that time has decreased greatly because of war restrictions and in 1943 all production was for the account of the Government.

Apple juice enriched or fortified with Vitamin C has been supplied to all branches of the Canadian armed forces since 1943.



BUTTER SHORTAGE

Because of the boom in wartime incomes there is now greater demand for butter than at any time in our history, while the requirements of the American and Russian armed forces keeps the supply well below normal years. The black lines in this chart, issued by WFA, reflects the quantity going into civilian distribution, while the white extensions show the amount set aside by WFA.

Plan to Expand Direct Distribution of Food

THE Department of Agriculture is planning to expand its program of direct food distribution after the war, according to a WFA statement.

The goal of the program is to take surpluses from the places where they only create problems and to move them to places where they are needed. Since many surpluses are likely to be found in government hands after the war, both as a result of price support programs and wartime stockpiling, the direct distribution program should have a great many commodities with which to work.

Thirty percent of the receipts from collection of customs is set aside for administration of the program. The principal activity thus far established has been the school lunch program, but many other outlets have shared in direct distribution.

WFA Eases Food Orders As Requirements Permit

THE War Food Administration is closely following its policy to terminate controls over distribution of food products as soon as the need for the controls has ended. No wholesale cancellation or orders may be expected before V-E day and the possibility of any unwarranted number of cancellations following that date is remote.

An investigation of action already taken on 121 orders put into effect between January 1, 1943, and October 1, 1944, shows that 48 of the orders have been cancelled or suspended and 73 are still on the books. Not all of these orders affect food processors.

To
EXECUTIVES • TECHNOLOGISTS
in the
FOOD INDUSTRIES
WITH PROBLEMS TO BE SOLVED

Have you a Food Equipment Development Problem which has been bothering you? If so, we believe that Artisan Metal Products Inc., an engineering and manufacturing firm, which has specialized for the past ten years in solving problems for both the Food and Chemical Process Industries, can be of assistance to you.

Artisan Engineers have a background and experience in Chemical and Mechanical Engineering which is of value to the Food Industry. They know how to get heat into, and out of, products quickly or slowly. Since heat flow, along with fluid flow, is the fundamental background for Heating Equipment of all types, evaporators, cooking, etc., Artisan's engineers can contribute materially in assisting your engineers by offering specialized experience in these important fields.

Most Food Processors who develop a new product or improve an "old stand-by" work out their ideas in the laboratory. Then the laboratory tries to assist the engineering department in developing the laboratory process to mass production. This is a slow phase in the development of any product and is the spot where Artisan engineers have helped many clients. *We believe we can help you, too.*

Artisan specializes in the design and manufacture of Pilot Plant Equipment for transforming the ideas of the laboratory to meet the problems of mass production. *Artisan is not too big to engineer a small piece of equipment carefully, to help your staff operate it, and to make changes in the equipment to meet changing requirements.*

If you believe Artisan Engineers can assist in solving your engineering and equipment problems, please write asking for an engineer to call.

ARTISAN METAL PRODUCTS INC.
13 Sullivan Square
Boston 29, Massachusetts

GMA Looks to Future Of Food Manufacturers

AN ALL OUT campaign for descriptive labeling and an appeal to food manufacturers to get behind the grocer-consumer anti-inflation campaign, were among the principal topics discussed at the 36th annual meeting of the Grocery Manufacturers of America, at New York's Waldorf-Astoria Hotel, November 21-22.

As the first step in the grade labeling campaign, GMA published a six-page booklet under the title "Where Do You Stand on Grade Labeling." In short, terse sentences, the booklet presents the story of voluntary descriptive labeling as opposed to mandatory grade labeling. It outlines a positive program for the food manufacturers to follow if they—and the consumer alike—are to be spared the quality limitations inherent in grade labeling.

Listing leading food manufacturers who have already pledged publicity support for the anti-inflation campaign, J. Sidney Johnson, OPA director of trade relations, asked all food manufacturers to promote the drive through advertising, calling public attention to the campaign to keep food prices down. He said that 250,000 food stores are cooperating in displaying printed pledges, affirming that their merchandise is being sold at ceiling prices or less.

Charles Wesley Dunn, GMA general counsel, discussed the Sherman Anti-Trust Act, as the first law of trade. He advocated repeal of the labor union exemption from the act, an amendment to the act to provide standards that prescribe compliance rules, protect small business and balance the application, another amendment to authorize advance advisory opinions, and supplemental legislation to create a special economic court to adjudge enforcement cases under the Act. "If it is a good public policy to have a special Federal Trade Commission to administer a supplemental anti-trust law," Mr. Dunn said, "then it is equally good policy to have a special Federal Trade Court to enforce the basic anti-trust law."

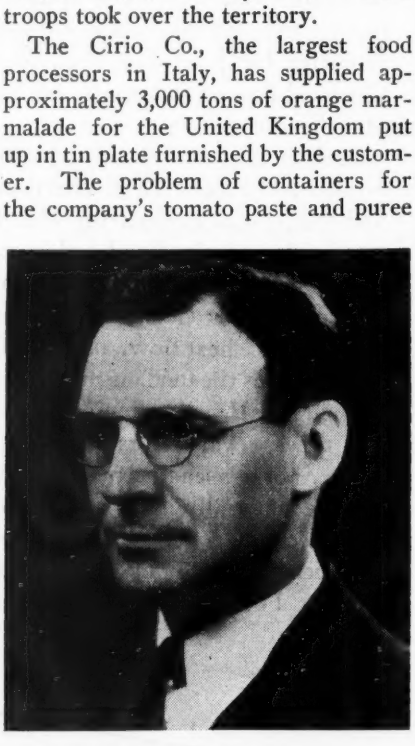
Lee Marchall, WFA director of distribution, reiterated his frequently expressed assurance that there is little likelihood of difficulties due surplus foods next year. Mr. Marshall pledged the cancellation of every government restriction that does not bear directly on beating Japan, as soon as the war in Europe is brought to an end.

Paul S. Willis, GMA president welcomed the delegates with the prediction that the food industry will be the first major industry to convert fully to peacetime production, while James S. Adams, president of Standard Brands, Inc., foresaw bright job prospects for returning veterans in the industry.

Italian Food Plants Suffer Little Damage

LIBERATED areas of Europe will not represent a heavy market for food processing machinery if southern Italy is a true example of the destruction that follows military operations and enemy sabotage. Competent official observers report that by and large the food processing plants in the area south of Rome, including Sicily and Sardinia, were in at least partial operation within 60 days after Allied troops took over the territory.

The Cirio Co., the largest food processors in Italy, has supplied approximately 3,000 tons of orange marmalade for the United Kingdom put up in tin plate furnished by the customer. The problem of containers for the company's tomato paste and puree that is consumed locally has been solved by storing it in barrels.



RECEIVES GMA AWARD

Dr. Charles Glen King was presented with the tenth annual GMA Scientific Award, at the association's recent meeting, "in recognition of his numerous fundamental contributions to the science of nutrition, involving among other accomplishments the isolation in pure form of vitamin C and studies of its biochemical role in nutrition." His leadership in the science of nutrition as scientific director of the Nutrition Foundation was also cited.

Magnitude of the Cirio operations can be judged from some of the statistics. One plant at its peak of operation employs in the neighborhood of 2,000 people. The company in addition to the marmalade already mentioned has supplied the British with approximately 5,000 tons of canned peeled tomatoes and 2,500 tons of canned fruits and vegetables. The annual output is approximately 250,000,000 cans.

Reports from the Foreign Economic Administration hail the arrival of three shipments of Italian merchandise which include 74,000 lb. of lemon oil, 20,000 lb. of onion seed, 90,000 lb. of bergamot oil, 1,000 lb. of orange oil and 66,000 gal. of wine, in addition to other nonfood products. This would indicate that the citrus fruit industry of southern Italy is back in operation. The processing plants of Italy and Sicily produce oils of all kinds from the citrus fruits as well as other by-products in great variety.

Paper Holidays Are Sponsored by WPB

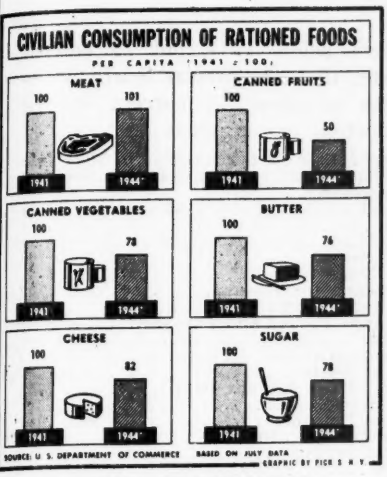
THE War Production Board will redouble its efforts in the next few months to get more cities to sponsor "paper holidays," declared Harold Boeschenstein, deputy vice-chairman for operations. In reviewing the local paper salvage drives that have already run, Mr. Boeschenstein paid tribute to the communities which had sponsored holidays and urged more cities to adopt them.

With war programs for the last three months of this year scheduled to break all past records and with the scarcity of paper for civilian needs greater than ever, we are redoubling our conservation and salvage efforts."

Recent "A" Awards:

IN RECOGNITION of outstanding performances in the processing of food, the following plants have earned the WFA achievement "A" award.

The plants are: Blytheville Canning Co., Blytheville, Chester B. Franz Co., Mammoth Springs, Ark.; Campbell Products Co., Campbell, S. & W. Fine Foods, Inc., Redwood City, Bercut-Richards Packing Co., Sacramento, Calif.; Delta County Canning Co., Delta, Colo.; General Mills, Inc. Chicago Cereal Plant, Chicago, Ill.; General Mills, Inc., Purity Oats Division, Keokuk, Ia.; Maine Food Processors, Winterport, Me.; Cudahy Packing Co., New Ulm, Minn.; General Mills, Inc., Kansas City, Chester B.



EFFECTS OF RATIONING

These comparisons show how well our food production and distribution have held up in the face of wartime demands. In 1944 over 8 percent of our population was in the armed forces.

Franz Co., St. Louis, Mo.; The Fairmont Creamery Co., Omaha; G. L. F. Waterloo Farm Products Co-op. Inc., Waterloo, N. Y.; G. L. F. Columbia Farm Products Co-op., Inc., Bloomsburg, Pa.; Cedargreen Frozen Pack Corp., Wenatchee, Wash.; J. C. Grant & Son, Clinton, Holmes Packing Co., Eastport, Machiasport Canning Co., Eastport, Seaboard Packing Co., plants at Lubec and Robbinston, Me.; H. J. Heinz Co., Medina, Plymouth Rock Provision Co., Bronx, Washburn-Crosby Co., Buffalo, N. Y.; Armour & Co., plants at Petersburg and Sullivan, Ill.; Wapsie Valley Creamery, Inc., Independence, Ia.; The J. & F. Schroth Packing Co., Cincinnati, O.; George V. Hoskings, National City, Calif.; Bitter Root Canning Co., Hamilton, Mont.; Houston Packing Co., Houston, Tex.; Morton Packing Co., Louisville, Ky.

The Annual Index

To save paper, a very critical material, the Annual Index of the items published in the 12 volumes of FOOD INDUSTRIES during 1944 is being printed separately and does not appear in this last issue of the year. Any subscriber desiring a copy of the Index may obtain one free of charge by writing to FOOD INDUSTRIES, 330 W. 42nd St., New York 18, N. Y.—The Editors.

SCHEDULE OF EVENTS

DECEMBER

10-13—American Society of Refrigerating Engineers, 40th annual meeting, Hotel Pennsylvania, New York.

19—Association of Pacific Fisheries, 31st annual convention, Seattle.

JANUARY

21-24—National-American Wholesale Grocers Association, annual meeting, Drake Hotel, Chicago.

STAINLESS STEEL STORAGE and PROCESSING TANKS

INCREASE PRODUCTION and EFFICIENCY IN YOUR PLANT WITH THESE SPECIALIZED TANKS —

Metal-Glass San-I-Tanks give you safe, clean and rapid handling of any chemicals or liquids. These modern tanks are constructed throughout of 18-8 Stainless Steel making them immune to all acids and exceptionally easy to keep clean.

Tanks are finished with No. 4 polish on inside and bright finish outside. All Stainless Steel welded with inside welds ground smooth and polished.

San-I-Tanks incorporate special self-draining features with specially formed bottoms sloping to the front.

Built by tank specialists, San-I-Tanks incorporate every time saving, money saving feature. For years of trouble free service insist on San-I-Tanks.

MANY SIZES IN STOCK — READY FOR IMMEDIATE SHIPMENT

We endeavor to have a supply of stock sizes in San-I-Tanks on hand at all times. We have a tank for every application and in any size you need. Write us giving complete data on the size tank you need and we will, in many cases, have the tank in stock.

LET OUR ENGINEERS SOLVE YOUR SPECIAL TANK PROBLEMS

In addition to our complete line of stock sizes in San-I-Tanks which are stocked for immediate shipment, we also manufacture special sizes built to your requirements. If you have a special tank problem get in touch with us and our engineers will be glad to give you their suggestions. No obligation of course. If it's a tank problem we can solve it for you. Over 20 years of tank building experience backs the San-I-Tank so play safe and work with a tank specialist.

WRITE FOR COMPLETE LITERATURE AND PRICES

Metal-Glass Products Co.

Dept. FI. Belding, Michigan

RAW MATERIALS REVIEW

New Cottonseed Flour High in Protein Value

DR. D. BREESE JONES, internationally known protein authority of the Bureau of Human Nutrition and Home Economics, U. S. Department of Agriculture, gives the following official comment on the possibilities of using cottonseed flour in foods:

"There is now available a partially defatted, wholesome, and palatable cottonseed flour specially prepared for human use. Large quantities of this flour have been shipped overseas for Lend-Lease use. Its high protein content of 50 percent is exceeded by only a few other foods. The digestibility of cottenseed globulin, which represents the greater part of the seed protein is nearly equal to casein of milk. The total protein of cottonseed flour is as digestible as peas and beans, 80 percent as digestible as meat, and 90 percent as cereals.

"The nutritive value of a protein depends primarily on its amino acid composition. Most proteins are composed of about 24 different amino acids combined in a variety of ways. When we eat proteins we are eating amino acids. Eight of these amino acids are nutritionally essential factors. As with the vitamins, if only one of the amino acids is lacking or deficient in the diet, satisfactory health and nutrition can not be maintained.

"The protein of cottonseed flour is a good source of the nutritionally essential amino acids. It has a growth-promoting value approximately 4½ times that of wheat flour. It is well suited to supplement the proteins of certain other foods, particularly those of the cereal grains. It is estimated that about 36 percent of the protein used for human consumption in the United States is furnished by cereal grains, chiefly wheat. Wheat flour is known to be deficient in some of the essential amino acids abundant in cottonseed flour. Addition of as little as 5 parts of cottonseed flour to 95 parts of wheat flour produces a mixture containing 16 percent more protein than wheat flour alone, and a protein combination definitely superior in its growth-promoting value to the same quantity of protein from wheat flour."

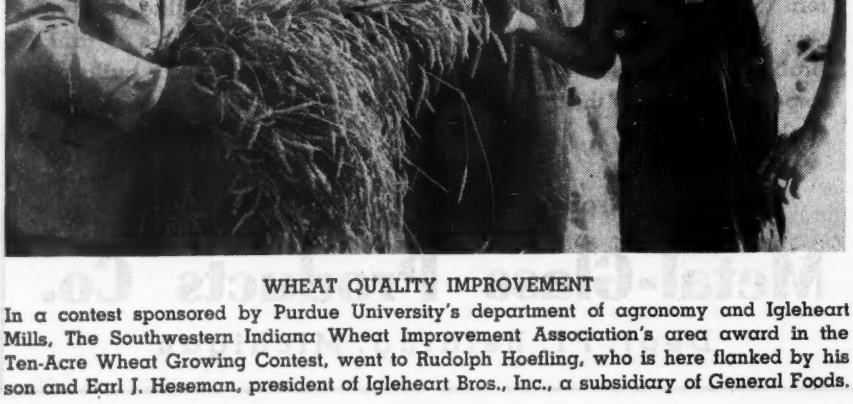
WFA Asks Heavy Goals For 1945 Crop Yield

CROP GOALS to provide only slightly less food than this year's record production, have been set by WFA for 1945. Sharp increases are recommended in some crops, particularly sugar cane, flax and sugar beets.

A total crop acreage of 364,000,000 acres was recommended. This compares with total plantings of about 360,000,000 acres this year. On the basis of anticipated lower yields, this was expected to produce from 5 to 10 percent below 1944, but 25 percent greater than the prewar level. A decrease of about 16 percent in egg production is suggested.

The following percentages of 1944 output have been recommended as the new crop goals.

Wheat	101
Rye	108
Rice	94
Dry Beans	100
Dry Peas	61
Soybeans for Beans	100
Peanuts, grown Alone	96
Peanuts, Picked and Threshed	96
Cotton	100
Broomcorn	99
Sugar Beets	147
Sugar Cane (except sirup)	111
Potatoes	101
Sweet Potatoes	100
Truck crops: Fresh	91
Processing	96
Corn	100
Oats	100
Barley	100
All Sorghums (except sirup)	94
Milk Cows on Farms	101
Hens and Pullets on Farms	82
Chickens Raised	94
Broilers, Commercial	100
Turkeys Raised	100
Pigs Saved: Spring	102
Fall	103
Beef Cattle on Farms (1st of year)	95
Beef Cattle on Farms (end of year)	94
Cattle and Calf Slaughter	103
Sheep and Lambs on Farms	97
Milk Prod. on Farms	102
Egg Prod. on Farms	84



WHEAT QUALITY IMPROVEMENT

In a contest sponsored by Purdue University's department of agronomy and Igleheart Mills, The Southwestern Indiana Wheat Improvement Association's area award in the Ten-Acre Wheat Growing Contest, went to Rudolph Hoefling, who is here flanked by his son and Earl J. Heseman, president of Igleheart Bros., Inc., a subsidiary of General Foods.

PROCESSING

Cereal Chemists Learn Trends in Shortenings

USERS of fats will obtain higher quality and, perhaps, wider variety of products in the future, according to Dr. Howard C. Black, Head of Fats & Oils Division of Swift & Co. Research Laboratories.

Speaking before the November meeting of the Midwest Section of the American Association of Cereal Chemists, in Chicago, Dr. Black revealed that the annual loss of 1,000,000,000 lb. of raw material supplies from the Pacific and East Indies islands since January, 1942, stimulated an increase in domestic production from 7,300,000,000 lb. average for 1935-39 to 11,400,000,000 lb. for the 1943-44 crop year.

During this period the percentage of total fats and oils used in shortening manufacture shifted from 64.4 percent cottonseed oil in 1939 to 41.7 percent in 1943; from 14.3 percent soya oil in 1939 to 41.5 percent in 1943; from 9.7 percent foreign vegetable oils in 1939 to 0.4 percent in 1943; and 0.5 percent lard in 1939 to 2.7 percent in 1943. There were smaller shifts in the use of edible tallow and oleo stearine but the shifts are significant in that their usage has increased. Usage of all this year will be about the same as 1943 except that soya oil percentage will exceed that of cottonseed oil.

Blends of oleo oil and hydrogenated oils have satisfactorily taken the place of coconut and palm kernel oils for candy making.

Soya, peanut and cottonseed oils, processed to have good stability with low melting point, make satisfactory spray oils for certain types of crackers. Hydrogenated meat fats, plasticized and combined with lecithin to obtain desired relationship between creaming quality, melting point and viscosity, function quite well in fillings for automatic machine application. Hydrogenated domestic vegetable oils with added lecithin function better than hydrogenated coconut oils in coatings for ice cream bars because of less tendency to shatter when being eaten. Hydrogenated peanut oil gives best results as it also does for oil roasting of nuts where control of melting point must be kept within a range that will avoid solidification on the surface of the nut, which gives it an undesirable appearance. Post-war use of tucum and muru-muru oils from South America may become general in the manufacture of coating fats or hard butters.

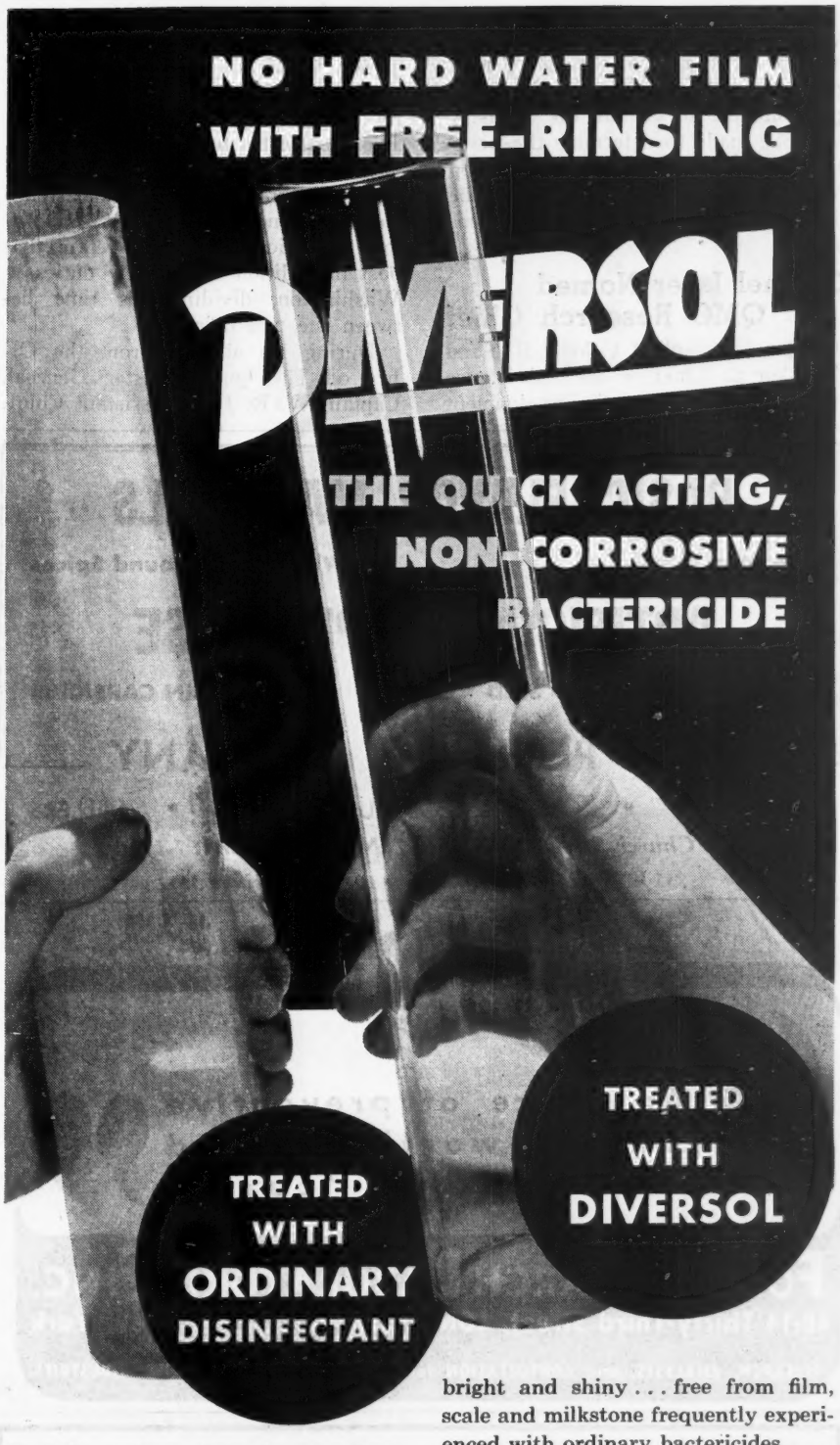
Development of processing methods during past years has built into blended shortenings and meat-fat shorteners blandness in flavor and odor not possessed by them during previous years. Deodorization has played its part. Use of antioxidants has increased stability in composition. Plastic ranges have been increased to meet Army needs so that shortenings hold their body at 120 deg. F. and are plastic and workable at 60 deg. F.

Pickle Packers Report Bumper Crop for 1944

MEMBERS of the National Pickle Packers Association attending their recent annual fall meeting, in Chicago, learned that the 1944 cucumber pickle intake will exceed 8,000,000 bu. This is more than 2,000,000 bu. greater than the 1943 intake.

When this report is interpreted on the basis of an October 1 salt-stock carryover of only 750,000 bu., a total consumption of 8,464,348 bu. since Oct. 1, 1943, and a WFO set-aside of 40 percent, the possibility of increased supply for the civilian trade does not appear promising.

Some apprehension was expressed with respect to contracting for 1945 acreage. The bumper 1944 intake is only the third in 15 years to exceed 8,000,000 bu. It is the result of unexpected favorable weather conditions and a successful 1944 farmer-industry program for increased acre-



If all the sanitary piping in your plant was made of glass, you'd quickly *see* the importance of a free-rinsing bactericide . . . like DIVERSOL.

It's all due to DIVERSOL'S unique water-softening action. DIVERSOL not only makes hard water soft as rain, but takes the hardness out in the form of a fluffy, light substance which is suspended in the solution. As a result DIVERSOL solutions rinse quickly and freely from the surface. Glass piping, bottles and glass lined tanks treated with DIVERSOL have a characteristic sparkle. Metal equipment is bright and shiny . . . free from film, scale and milkstone frequently experienced with ordinary bactericides.

A quick-acting, non-corrosive disinfectant, DIVERSOL also has the unique ability to penetrate invisible grease film beneath which milk-spoiling bacteria are likely to lurk. Comes in stable crystals that *seal-in* the available chlorine until dissolved in water. With DIVERSOL it is a simple matter to prepare solutions of a definite, germicidal strength. Just add to water . . . then rinse or spray the previously cleaned equipment.

THE DIVERSEY CORPORATION
53 West Jackson Blvd., Chicago 4, Ill.

age. Because of this apprehension renewal of the farmer-industry program for 1945 was postponed until a questionnaire survey of the industry could be made to determine the acreage outlook on the basis of 1944 crop returns to the farmers and of the likely 1945 prices for pickle cucumbers.

Colonel Isker Named QMC Research Chief

THE appointment of Colonel Rohland A. Isker as Chief of the Subsistence Section, Research and Development Branch, Military Planning Division in the Office of The Quartermaster General, has been announced by Major General Edmund B. Gregory, The Quartermaster General.

Colonel Isker has been director of the Quartermaster Corps Subsistence Research and Development Laboratory in Chicago and will retain that post in addition to his new duties in Washington, dividing his time between the two offices.

During his absence from the Office of The Quartermaster General, Captain W. R. Junk, Assistant Chief, will be in charge of the Subsistence Section of the Research and Development Branch. Dr. J. H. White will act in the same capacity at the Chicago laboratory.

Vitamin D Monopoly Claimed by Government

THE Anti-Trust division of the Department of Justice has intervened "in order to assert the public interest against alleged abuse of the patents" in the case under which Wisconsin Alumni Research Foundation seeks to prevent infringement of its patents for making vitamin D by irradiation of food.

This suit originally sought to protect licensees of the Foundation against competitors who had not taken a license, specifically Douglas Laboratories. Now the government acts to extend the court proceeding in the Chicago District Court. It not only makes certain specific charges against the Foundation but also brings these charges against sixteen named licensees who are charged with violating the anti-trust laws.

Citrus Standard Amended

AMENDMENTS that apply to the method for the determination of the "percent by volume of recoverable oil," have been issued by WFA for canned concentrated orange juice, canned grapefruit juice, canned orange juice and canned blended grapefruit and orange juice.

The method is included in the amendment in lieu of the former steam distillation method.

Food Processors Play Host to Food Editors

To FOSTER better public relations between food manufacturers and the food consuming public, thirty-five food editors from various midwestern and southern newspapers from as far south as Georgia, north to Wisconsin, west to Nebraska and east to Ohio, visited Chicago as guests of 10 leading food companies and associations during the week of October 30.

Dr. Totten Retires as Meat Inspection Chief

RETIREMENT of Dr. George E. Totten, chief of the Meat Inspection Division, is announced by H. E. Reed, chief, Livestock and Meats Branch of the War Food Administration's Office of Distribution. Dr. Totten completed 46 years of service with the U. S. Department of Agriculture. He will be succeeded by Dr. Albert R. Miller, assistant chief of the Meat Inspection Division.

BASIC FLAVOR MATERIALS

Essential Oils — Whole and Ground Spices

ARTIFICIAL MAPLE BASE

OLEO RESIN PARSLEY SEED — OLEO RESIN CAPSICUM

S. B. PENICK & COMPANY

IMPORTERS • CHEMICAL MANUFACTURERS • MILLERS

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FOUNDED FRL in 1922

"An ounce of *preventive* research is worth a pound of troublesome 'cure'!"

FOOD RESEARCH LABORATORIES, INC.

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RESEARCH, ANALYSES, and CONSULTATION for the FOOD, DRUG, and ALLIED INDUSTRIES

Barnett's

CAROTENE

Vitamin A Potency 600 Million Units Per Pound

A NATURAL FOOD COLORING

WRITE FOR INFORMATION

BARNETT LABORATORIES — LONG BEACH 5, CALIF.

GI WINE PROCESSING

These three GI's are French and so are the grapes, but the method employed to press the grapes is strictly international. At any rate they make no bones about liking the grape in any form, just so it's liquid.

Dr. Miller is a graduate of the Iowa State College School of Veterinary Medicine. He began his career in the Meat Inspection Division, nearly 18 years ago, as an inspector at the Chicago station.

Price Rise Denied

AN OFFICIAL request for an increase in the price of unroasted coffee was denied the Inter-American Coffee Board, in a joint action by Price Administrator Chester Bowles and War Food Administrator Marvin Jones.

In reaching their decision, the two government administrators carefully considered every phase of the coffee price problem, including the comprehensive memorandum on green coffee prices submitted by producing countries.

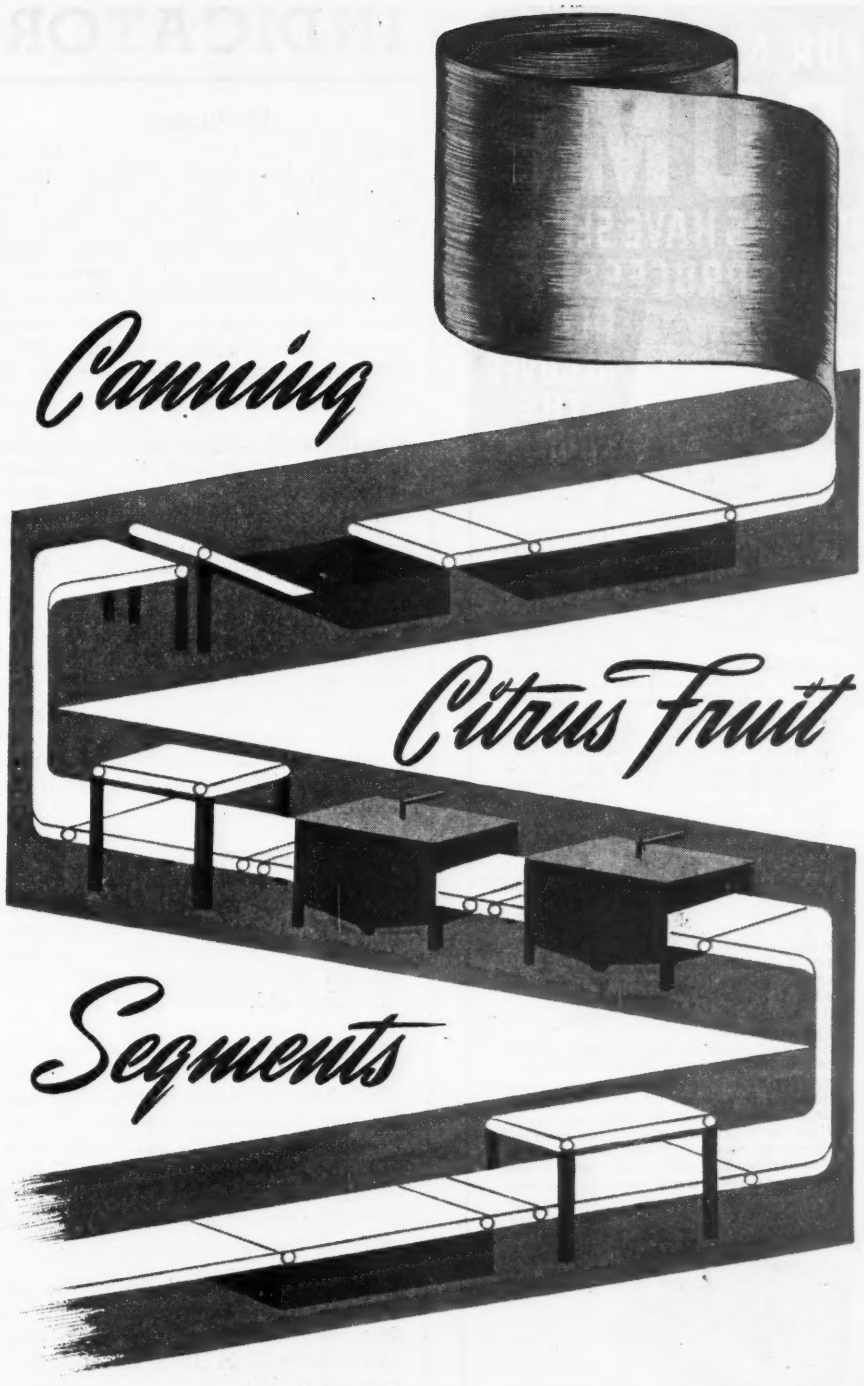
Drop in Meat Production

MEAT production in 1945 will be about 2,000,000,000 lb. less than this year due to a reduction in livestock numbers, according to a recent estimate of the Department of Agriculture. This will bring production down to below 23,000,000,000 lb. from the more than 24,500,000,000 lb. 1944 output.

Baker Succeeds Carroll

GEOFFREY BAKER, assistant director of OPA's Food Price Division, has been named director of the division to replace Jean F. Carroll, who resigned as of November 15, to return to private industry.

The new director came to OPA in March of 1942 as Chief of the Grocery Products Branch.



WHERE CONVEYOR BELTS *MUST BE* SANITARY . . . MOISTURE-RESISTING . . . LONG LASTING

In canning citrus fruit segments, where moisture, fruit juices, and alkali might deteriorate untreated cotton or other conveyor belts . . . play safe and use Globe Kanry-Tex conveyor belts. They are processed to meet canning plant requirements.

Globe Kanry-Tex is a solid woven cotton belting thoroughly impregnated with a synthetic compound. In addition to proofing the belt against moisture, fruit juices, etc., it also gives the belt a surface that is easy to clean with hot or cold water or live steam. Kanry-Tex meets all sanitary requirements.

At the same time, Globe Kanry-Tex assures (1) long life (2) minimum stretch (3) no slipping on pulleys (4) adaptability to small pulleys.

Consult your nearest mill supply house or write for further details on Kanry-Tex and other Globe "Specially-Made-For-The-Purpose" Belting and Webbing products.

GLOBE WOVEN BELTING CO.
1396-1400 CLINTON ST., BUFFALO, N. Y.

FOR MANY YEARS
BUMP
PUMPS HAVE SERVED FOOD PROCESSING PLANTS ALL OVER THE COUNTRY

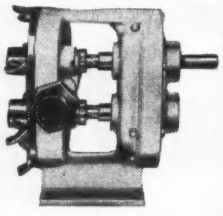
EASY TO CLEAN

FEW PARTS

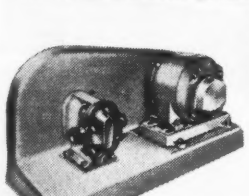
These plants know what real pump service means.

Superior features of Bump sanitary pumps have enabled them to maintain production schedules without interruption during these critical times, proving daily the advantages of Bump Pumps that guarantee protection of quality, since there is no contamination of the fluid being pumped.

The bearings are entirely separate from the pumping chamber.



Bump Pumps are 100% sanitary, positive displacement type that are self-priming under high vacuums and against head pressures, delivering a constant volume per revolution that is not affected by speeds or pressures. No churning, no agitation, no vibration within the pump—made in capacities up to 400 GPM. Backed by 15 years' successful experience in the food processing industry. Complete catalog information upon request.



SLOW SPEEDS · POSITVE ACTION
SELF PRIMING · NO CHURNING-ACTION · ONLY 2 MOVING PARTS

Principle of Operation

THE ORIGINAL DESIGNER AND MANUFACTURER WHO INTRODUCED BUMP PUMPS TO THE INDUSTRY

The BUMP PUMP CO.
LA CROSSE ★ WISCONSIN

INDICATORS

Production

Sugar deliveries from January to October, inclusive, were 5,973,487 tons, against 5,358,029 tons last year. The cane refineries' share of the total is nearly 900,000 tons larger than a year ago. Sugar imports for the ten-month period are 4,653,000 tons, a million tons more than a year ago. Stocks, however, are only 676,000 tons, almost 500,000 tons less than at the same time a year ago.

Manufactured dairy products per capita production and consumption (civilian) indicated for 1944 are as follows: Butter, production 14.2 lb., consumption 12.0 lb.; cheese, 7.8 lb. and 5.1 lb.; condensed and evaporated milk, 27.5 lb. and 15.1 lb.

Creamery butter production in September was placed at 112,835,000 lb. by BAE, 10 percent below last year and 20 percent lower than the ten-year average. Production for the first nine months was 1,211,771,000 lb., 12 percent lower than last year and than the ten-year average.

American cheese production in September was estimated by BAE at 67,025,000 lb., up 4 percent from last year and 36 percent above the ten-year average. Production from January through September totaled 644,931,000 lb. against 633,310,000 lb. in 1943.

Green peas packed this year total 30,130,834 cases of all sizes, compared with 33,826,568 cases in 1943, National Canners Association reports. Of the 1944 pack, 11,058,015 cases were Alaskas and 19,072,819 Sweets. Civilian stocks on hand on October 1 included 2,978,575 cases of Alaskas and 6,102,521 cases of Sweets.

Canned fish products index of the Department of the Interior was 79 for the first eight months of this year, compared with 85 in 1943 and a 1940-42 average of 100.

Fish frozen in the U. S. and Alaska during the first eight months of the year amounted to 187,499,000 lb., compared with 160,065,000 lb. in 1943, 150,493,000 lb. in 1942, 139,722,000 lb. in 1941 and 112,384,000 lb. in 1940, the Department of Interior reports.

Flour output in October increased 85,640 sacks over the same month in 1943, *The Northwestern Miller* reports. Production in October totaled 15,125,584 sacks, representing 73 percent of total U. S. output. The figure for the previous month was 14,695,484 sacks.

The Alaska salmon pack is down, being 4,856,330 cases this year as compared with 5,409,001 in 1943. The year's pack includes 1,567,735 cases of reds, 2,079,306 of pinks, 989,602 of chums, 85,940 of cohoes and 33,741 of king salmon.

Meat production, including beef, veal, lamb and pork, totaled 1,455,000,000 lb. in Federally inspected plants during October, American Meat Institute reports. This was 14 percent greater than in September and 29 percent higher than the ten-year average.

California fruit pack for 1944 is the largest in history. Totaling 28,653,557 cases, it exceeds last year's pack by 9,233,167 cases. Comparison of the 1944 and 1943 packs of the different fruits follows: apricots, 7,953,697 cases in 1944 (1,124,922 in 1943); cherries, 249,402 (143,646); pears 1,454,745 (1,747,172); cling peaches, 12,311,317 (10,182,027); freestone peaches, 357,595 (536,697); fruit cocktail, 6,153,769 (5,621,004); mixed fruits, 163,032 (74,922).

In Storage

Fishery products in cold-storage warehouses in the U. S. and Alaska totaled 131,618,000 lb. on October 1, compared with 98,225,000 lb. last year. Holdings of cured fish amounted to 24,341,000 lb. on September 1 against 24,598,000 lb. in 1943.

Frozen poultry in storage was up 59,000,000 lb. on November 1, totaling 246,856,000 lb. This was the most significant change in freezer holdings in October.

Frozen fruits in storage on November 1 amounted to 300,922,000 lb. as against 298,059,000 lb. a month earlier.

CHANGE OF ADDRESS

McGRAW-HILL PUBLISHING COMPANY
330 West 42nd Street, New York 18, N. Y.
Director of Circulation:

Please change my address on "Food Industries"

From .....

.....

To .....

.....

Signed .....

CONSTRUCTION NEWS

	Pending (thousands)	Awarded November (thousands)	Total Awarded 1944 (thousands)
Bakery	$ 80	$ 40	$ 394
Beverages	115	100	220
Canning and Preserving	120	....	405
Cold Storage	720	....	1,808
Confectionery	40	....	90
Grain Mill Products	1,795	45	1,800
Ice Manufactured	45	....	40
Meats and Meat Products	250	250	1,235
Milk Products	480	322	2,553
Miscellaneous	1,455	302	2,741
	$5,100	$1,059	$11,286

Creamery butter stocks in refrigerated warehouses were 85,595,000 lb. on November 1, down from 93,856,000 lb. a month earlier and 148,612,000 lb. a year ago.

Eggs in cold storage, all types, on November 1 totaled 20,893,000 cases, down from 24,381,000 a month earlier but higher than the 16,753,000 figure a year ago.

Raw Materials

Milk production in 1945 may reach 119 billion pounds, BAE predicts, if returns to farmers are held at about the same level as in 1944. The billion pounds of added production probably will go mainly into manufactured whole milk products. Creamery butter output in 1945 may be slightly lower than the 1.5 billion pounds expected this year. But production of evaporated milk and dried whole milk may be above 1944 levels.

A corn crop of record proportions, 3,200,000,000 bu., is forecast by the Department of Agriculture. This figure is 65,000,000 bu. larger than the 1942 crop, the previous record. The carryover of old corn, however, has diminished to 218,000,000 bu., the smallest since 1937.

Fish landings and receipts index of the Department of the Interior (excluding imports) was 95 for the first eight months of the year, against 92 in 1943 and a 1940-42 average of 100.

Indexes

Cost of living index of National Industrial Conference Board was 105.1 for October, up 0.1 from the previous month. The index a year ago was 103.7.

Wholesale food price index of Irving Fisher stood at 122.5 on November 17, up one point from 1943.

Business activity index of *Business Week* was 231.0 for the week ending November 11, compared with 230.3 a month earlier and 241.1 a year ago.

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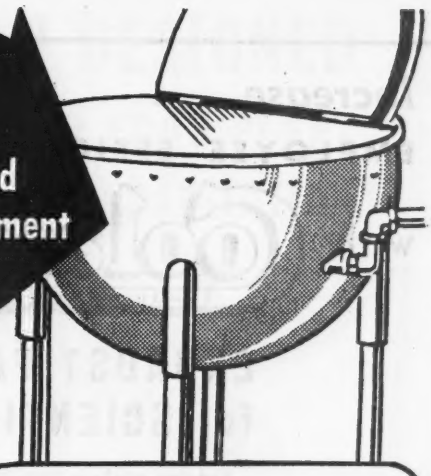

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★ candy cooling slabs
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★ blanchers
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★ milk cooling vats
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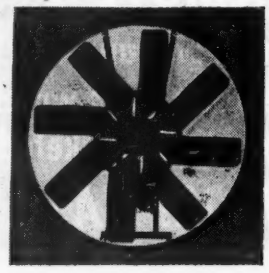

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WFA Orders

Cheddar Cheese — Manufacturers of Cheddar cheese must set aside 25 percent of production during December, the same set-aside that was in effect in November. The action, included in WFO 15.11, represents a reduction from the 40 percent set-aside in effect during October.

Milk Solids—The set-aside on spray nonfat dry milk solids remains at 40 percent of production during December and January, according to Amendment 6 to WFO 54.4.

Hogs—Good and Choice butcher hogs weighing between 200 and 270 lb. will be supported at $12.50, Chicago basis, until June 30, 1945, according to a WFA announcement, November 16. Since October 1 the support price had applied only to the 200 to 240 lb. hogs. Previous to October 1, however, hogs weighing 200 to 270 lb. were supported.

Cocoa Beans—Under Amendment 2 to WFO 25 processors are prohibited from selling any manufacturer of confectionery cocoa bean products for resale except as manufactured products ready for retail distribution. The processor is also prohibited from selling any manufacturer in excess of a 60 days' supply.

OPA Orders

Liquid Whey—All sales of liquid whey are freed of price control by Amendment 49 to MPR 280, effective November 6. It is hoped that this action will end the confusion as to the proper pricing of this byproduct of manufactured dairy products.

Canned Foods—Producers must continue to file reports on production of canned or bottled soups, vegetables or vegetable purees, frozen foods, baby foods, jams, jellies, fruit butters, marmalades, preserves, dried prunes and raisins, even though they have been removed from the rationing program, according to Amendments 61 and 62 to RRO 13.

Rationed Foods—Bakers, confectioners, breakfast cereal makers and other industrial users of rationed foods must make application to OPA before December 15 for any upward adjustments in allotments of rationed foods or changes in ration bases required as the result of pre-rationing investment in equipment for expansion in production, according to Amendment 51 to RRO 3, Amendment 59 to RRO 13 and Amendment 26 to RRO 16, all effective November 3.

Primost Cheese—An increase of 3 cents per pound, at all levels, in the ceiling

price of primost cheese is authorized by Amendment 50 to MPR 280, effective November 6. The former maximum price was too low to cover even the costs of production.

Minor Foods—Processors' ceiling prices for minor fruits, berries and vegetables of the 1944 pack will be obtained under Pricing Method 2. This method is incorporated in Amendment 15 to Supp. 7 to Food Products Reg. 1, effective November 17. Methods for pricing the major pack were covered in Pricing Method 1, included in a previously announced amendment.

Cherries and Pears—Amendment 14 to Supp. 7 to FPR 1 provides the formula and the permitted increases in ceiling prices for light sweet cherries and Bartlett pears produced in Washington and Oregon. The amendment is effective November 16.

Sugar—A formula for determining the processors' ceiling prices for new grades of sugar in special packages is directed through Amendment 13 to RPS 60, effective November 21.

Citrus Products—Provision for adjustable pricing of packed citrus products to be sold to government agencies is made in Order 2, under Supp. 5 to FPR 1. These sales and deliveries may be made by processors to government procurement agencies only, subject to an agreement between buyer and seller, in each case, that the final price shall be determined after new ceiling prices are announced.

Lamb—The wholesaler's markup on lamb and mutton cuts and carcasses is increased 75 cents per hundredweight by Amendment 5 to MPR 396 and Amendment 15 to RMPR 239, both effective November 21.

WPB Orders

Steel Drums—New steel drums of more than 12-gal. capacity for packing certain bulk foods may be accepted by shippers until Jan. 29, 1945, according to Dir. 2 to L-197. Such items as lard, dairy products, cold pack and frozen products, jellies, jams, preserves, molasses and sirups are involved in the relaxed order.

Lab Equipment—An amendment to L-144, issued October 21, reduces the types of laboratory equipment that may be sold only upon authorization of WPB. Items not on List A of the amended order require no authorization.

Container Machinery—Restricted deliveries of container machinery are relaxed by the revocation L-332. It is to be noted, however, that L-292, covering certain types of container machinery and equipment is still in effect.

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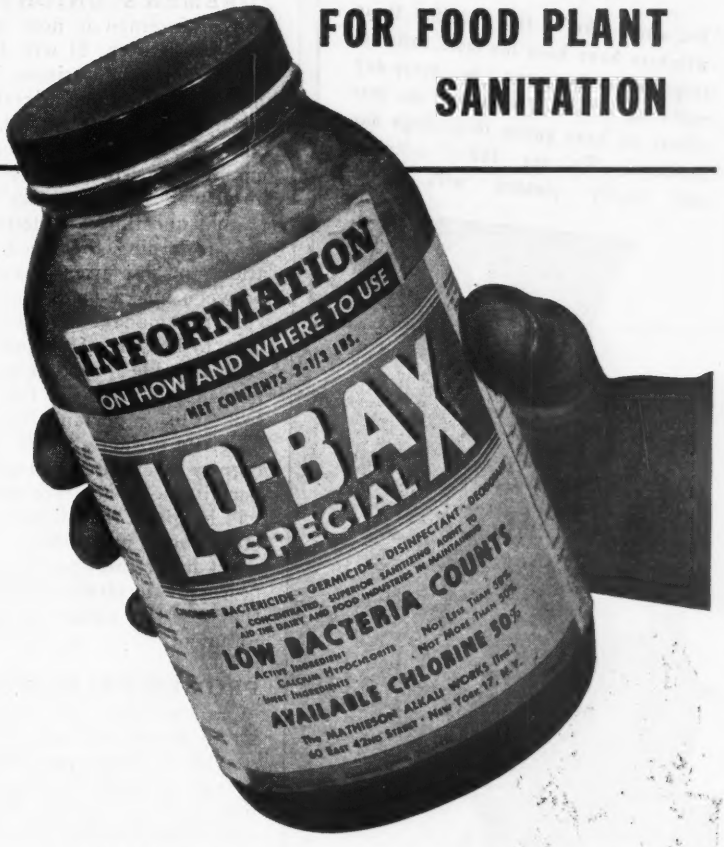

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CAPITAL VIEWS

FOREMEN'S UNIONS — Organization of foremen is now under way in many industries. It will develop in the food processing business just as it has in the automotive, aircraft, and other metal-working industries. The question is: Are these foremen a part of management or are they a part of the hired wage-earner group? The answer to that question will determine a great deal regarding the freedom of negotiation and the friendliness of relations between top management and foremen.

If top management wants the foremen to be part of management, and as such capable of group negotiation, but not subject to the detailed union control, it is important that the foremen be given in fact as well as in name the dignity so credited to them. If they are permitted to act like managers, they will be given that dignity in bargaining both above and below. Top management has largely in its own hands the power of deciding on these matters by the way in which it treats its own foremen.

PROMPT UNLOADING—All kinds of railroad cars are scarce. It costs a lot of money to hold a car needlessly overtime. Demurrage charges on boxcars even reach the large sum of $16.50 per car per day when the cars are held more than four days beyond free time. Even shorter overtime is costly. Loading and unloading schedules must, therefore, be accurately planned *and kept.*

PROTEIN QUALITY—We used to think that any protein was good protein. Perhaps it still is. But food technologists now know that some proteins are more valuable in the diet than others. For example, it is now clearly proved that certain cottonseed flour has unusually high concentration and high quality of protein. This suggests the importance of considering whether this cottonseed flour, which by special processes has been made palatable, may not deserve an important place in many of our food formulas where it never before was found.

POSTWAR GEOGRAPHY — Previously we have noted the changes in consumer markets which resulted from movement of workers to congested war centers. There is now beginning another migration, partly natural, partly artificial, which is going again to change our food distribution problems. Some of the effects will reach clear back into the factory because the habits of food distribution and consumption vary from one part of the country to another.

Relocation of surplus war workers, relocation of returning veterans, and the sale of surplus war factories will all stimulate new migrations of millions of people. There is even talk that the St. Lawrence seaway may change our geography materially by making Chicago, Duluth and Detroit deep-sea ports. It is going to be extremely important for the food technologists to watch these movements as they develop during the next few years. Each will have the job of interpreting them as they influence his own business, an influence which surely will be great in the course of time.

MORE DRY ICE—There is a serious scarcity of carbon dioxide both for carbonation and for dry ice. WPB has been told by the industry spokesmen that an additional 30,000 tons of carbon dioxide per month is needed to meet important demands. About one-quarter of this total has been authorized in priorities for construction of new facilities. The industry urges that the other needed three-quarters be promptly approved. They cite the need particularly for ice cream, beverages, food and railway refrigerants, as well as industrial chemical applications. Those in the food industries who are troubled by the current scarcity can well add their voice of demand for prompt action in the Chemicals Bureau of WPB.

SPOT AUTHORIZATIONS—Fortunately, not many food manufacturers need to get official approval before they can return to their normal peacetime businesses. However, a few do; and many equipment and supply companies which serve the food factory are so restricted. Food technologists can urge that such companies go promptly to WPB and ask for action under its Spot Authorization Plan. Well over a thousand applications had been approved by mid-October. Those who do not seek this authority may find themselves uncomfortably far down the list when V-E Day gets here.

VITAMIN MONOPOLY — Department of Justice charges that Wisconsin Alumni Research Foundation and its licensees are doing wicked things in the marketing of products containing vitamin D. The government charges all sorts of conspiracy in these matters under the Steenbock patents. Thus it has sought to enter the Federal court which is trying a patent infringement case which may ultimately determine the standing of these patents. Everyone using these patents or interested in them, even as a competitor, will need to follow the antitrust charges. And it is likely that this case will ultimately bring out the attitude of the Department of Justice regarding all classes of nutrient components added to food as a result of scientific research and development work. Let us hope that the Department activity does not do more restricting than the patents do. There is a chance even of that, especially if the Department makes it of dubious advantage to do a good job in food technology.

A BIG JOB FOR MILK—The importance of milk in the civilian diet was never better described than by a recent statement credited to W. E. Krauss, Ohio Agricultural Experiment Station, when he said: "Dairy products supply 77 percent of the calcium, 47 percent of the riboflavin, 39 percent of the phosphorus, 24 percent of the protein, 19 percent of the vitamin A and 18 percent of the fat in the average civilian food diet." This, of course, means that milk itself, primary dairy products, and many other food products containing these are of constantly increasing interest in both the fresh-food and processed-food industries.

WFA BACKS OUT—Gradually the number of active food orders governing specific commodities under War Food Administration is being reduced. It is like payments on the old home mortgage. Some day we will have a ceremony of WFA order burning. And that will be a day for celebration even though we all know that a lot of this order business has been necessary to the country's war effort.

STANDARDS CONTROVERSY—Advocates of advertised brands of food and other commodities are now shouting about Washington that brand advertising will so stimulate the use of goods by the American people as to be a large factor in creating new employment.

The agencies pressing this view are seeking to offset the official planners' efforts to make standardized goods sold under grade specifications more important from the standpoint of quality than products sold under recognized brands. The food technologists can see in both sides of this argument the increasing appreciation of the need for quality control, whether the product is to be sold under a standard or as a branded item. It looks like advertising for good food technology by both sides in the battle.

CONTAINER ACCIDENTS — A large percentage of container accidents during transportation result from splashing or spilling of acid or other chemicals left in drums or other containers supposed to be empty. Frequently truck men and railroad workers are injured because some factory worker failed to drain all of the liquid out of a container before sending it back as an "empty." This also wastes valuable material which the boss has to pay for and which increases costs. Hence it is a good practice for everybody in the works where containers of chemicals are emptied to follow the slogan "Drain those containers!"

WAR BOND PRIZES—Often a small bonus will bring back a great many returnable containers for reuse. This is a fine place at which to use war bonds for those outside agents of the company who can largely influence the cooperation between producer and customers.

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Monsanto Sodium Benzoate flakes are free-flowing... easier to apply in exact amounts.

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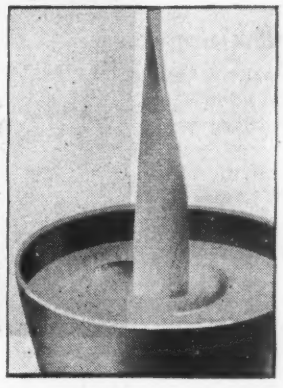
Monsanto Sodium Benzoate flakes do not "ball"...spread easily ... dissolve quickly.



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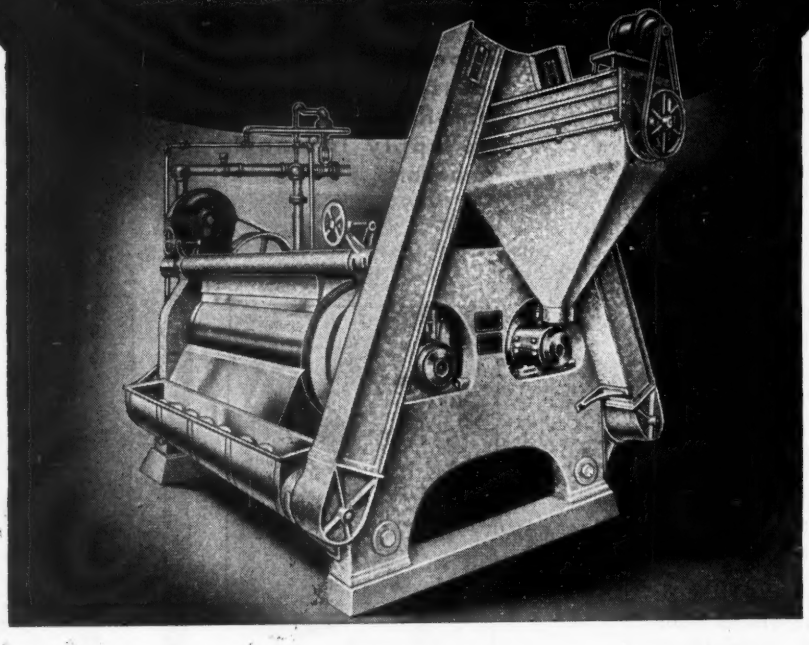

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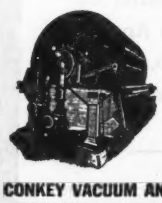

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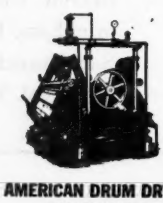
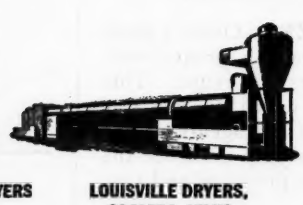
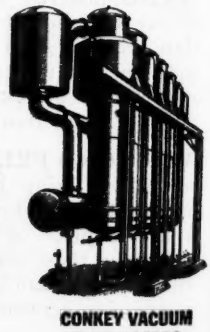


AMERICAN DRUM DRYERS AND FLAKERS



LOUISVILLE DRYERS, COOLERS, KILNS



CONKEY VACUUM EVAPORATORS

MEN · JOBS · COMPANIES

INDUSTRY

Harold H. Clapp, Inc., is scheduled to begin construction of a $165,000 plant in San Jose, Calif. The new plant will cover an area of approximately 85,000 sq. ft.

Converted Rice Co., Houston, Tex., has begun construction of a new $750,000 power plant. The new plant is expected to be in full operation by the end of January, with a heavily increased production output over the present operation.

Frostcraft Packing Corp., San Francisco, began packing operations in its new San Jose quick frozen foods plant No. 2 during the latter part of October. T. Goodrich has been appointed as the plant's manager. The estimated capacity of this addition is set at 35 to 45 tons daily, which doubles the previous production of the company.

General Foods Corp. recently announced the acquisition of the Yuban brand of coffee and certain other assets from the Paton Corp.

LaChoy Food Products, Archbold, Ohio, division of Beatrice Creamery Co., is introducing a new mixed vegetable juice to be called "Vegemato Cocktail."

Pillsbury Flour Mills Co., which has changed its name to Pillsbury Mills, Inc., has increased its maximum authorized capital stock from $20,000,000 to 100,000 shares of preferred stock without par value and $50,000,000 of common stock.

Purity Meat Packing Co. has filed a certificate of partnership in Buffalo, N. Y. The partners are Frank J. Beiter, Jr., William H. Ruth, Carlton H. Zink, and Richard P. Rogers, Jr.

Oregon Livestock Co-Operative has announced plans for construction of a $100,000 slaughter house, cold storage plant and quick freeze unit. The announcement came from Oregon City.

Seguin Peanut Co., Seguin, Tex., lost its shelling plant by fire of undetermined origin on October 31. The loss was estimated at $15,000.

Shefford Cheese Co., Indianapolis, Ind., has completed arrangements to take over a section of the old Knight Packing Co. in Portland, Ore. After remodeling, the plant will have an estimated capacity of from eight to ten million pounds of cheese per year. The company, a subsidiary of Standard Brands, Inc., has other plants at Green Bay, Wis., Nashville, Tenn., Syracuse, N. Y., and Dallas, Tex.

J. S. ROSS

Advancing from the post of vice-president and director, J. S. Ross became president of Grocery Store Products Sales Co., on November 3. Mr. Ross joined the Foulds Co. in 1925, which became part of Grocery Store Products in 1929. He succeeds B. C. Ohlandt, who resigned to join the executive staff of Schenley Distilleries, Inc.

Swift & Co., Chicago, has announced tentative plans for construction of a large gelatine and industrial oil manufacturing plant on a 70-acre tract at Hammond, Ind. The size and cost have not yet been determined, though Swift has taken an option on the property.

Ward Baking Co. of Ohio is building a $30,000 bakery in Columbus on a site recently purchased from the Lang Bakery.

Wayne Co-operative Milk Producers, Inc., plans to construct a new glazed-tile milk plant of two stories and basement to cost approximately $130,000. Construction will begin early in 1945 on a site northeast of Fort Wayne, Ind.

PERSONNEL

Carl F. Allen, formerly in the Minneapolis office of Commander-Larabee Milling Co., has been named manager for the Baltimore-Washington area for Larabee Flour Mills Co., succeeding E. R. Andrews, who resigned to join Standard Milling Co., Chicago.

C. S. Becker has been appointed general manager of the traffic department of the Borden Co. He joined the company in 1912, and succeeds Ernest Hadler, who died October 31.

WILSON D. SANDERSON

Recently appointed manager of the Petri Wine Co., Tulare, Calif., Wilson D. Sanderson formerly was associated with General Mills and later was vice-president of Victor Flour Mills, at Rochester. During the past 2½ years, Mr. Sanderson headed the beverage section, food price division, Office of Price Administration.

David W. Broadfoot, former district representative for General Foods, Inc., has joined Omar, Inc., Omaha, Neb., as division sales manager in the milling division, in charge of the offices at Chicago, Des Moines, Denver, Omaha and Memphis.

G. W. Cook was recently elected president of the Emmart Packing Co., Louisville, Ky., succeeding the late W. W. Craford. Mr. Cook continues as general manager of the company.

Arthur Farrar, formerly plant superintendent for the Cloverleaf Creameries, Inc., Huntington, Ind., has been named manager of the Kraft Cheese Co. plant at Gallatin, Tenn.

Robert R. Farrar has been appointed to head the Research Department of Purity Cheese Co. at Mayville, Wis. He will be in charge of the technical phases of the company's operations.

Frederick F. Jursek has been named manager of the Baltimore sales office of Quaker Oats Co., succeeding the late John B. Garvery.

C. F. Kiel, supervising salesman of the Pittsburgh branch territory, eastern division of General Mills, Inc., succeeds the late A. McPhail as sales manager of grocery products.

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Otto A. Knauss has resigned as vice-president of Igleheart Bros., Inc., Evansville, Ind., to become a partner with Henry C. Meining, Chicago, in the general sales and distribution of flour, cereals and kindred products. The new Meining-Knauss Co. will operate the business of the United States Flour Milling Cos.

Dr. C. B. Lane has been appointed to head the research laboratory of Blue Moon Foods, Inc., Thorp, Wis.

David Lakritz, chief chemist in the New York plant, and Leonard Katz, manager of the West Coast plant, have been appointed vice-presidents of Florasynth Laboratories, Inc.

Harry D. Liggitt, Jr., formerly chemist for the Colorado Milling & Elevator Co., Denver, Colo., has been appointed director of laboratories. M. A. Rust, former research assistant to Mr. Liggitt, has been named director of chemical and bakery research, and Martin Wise, formerly with the Nebraska Consolidated Mills Co., Grand Island, Neb., has been appointed chief chemist.

Joseph A. Lubitz is now research chemist with the J. R. Watkins Co., Winona, Minn. He formerly was with the Processed Foods Inspection Laboratory of the U. S. Department of Agriculture, Chicago, Ill.

Roger H. Lueck, formerly director of research for American Can Co., becomes manager of sales for the Pacific division in San Francisco.

Hugh R. McLaughlin has retired as vice-president of General Mills and president of its central division, with headquarters in Chicago, after 47½ years of service with the firm. J. E. Skidmore, formerly executive vice-president of the central division, succeeds Mr. McLaughlin.

Tate M. Robertson, Jr., has been named special sales representative for the Yeast, Malt & Corn Products Division of Anheuser-Busch, Inc., St. Louis, with headquarters in Washington, D. C. Much of his work will be in connection with customer relations and market research.

J. V. Snyder, superintendent of the Topeka plant of John Morrell & Co., has been appointed superintendent of the Ottumwa plant, succeeding H. C. Morris, who has retired from this position. John P. Foster has been appointed to succeed Mr. Snyder as superintendent of the Topeka plant.

Frank P. Viviano has been elected president of V. Viviano & Bros. Macaroni Mfg. Co., Inc., St. Louis.

Jason F. Whitney, president of Blue Moon Foods, Thorp, Wis., has been appointed a cheese pricing consultant for OPA.

RALPH R. WEAVER

Hills Brothers Co., New York, recently announced the appointment of Ralph R. Weaver as director of advertising activities. Mr. Weaver was associated with the company from 1921 to 1927. During the past 16 years he has been associated with the Street Railways Advertising Co. and George F. Stuhmer and Co., of Brooklyn.

INDUSTRY

Henry D. Aves, Jr., 46, manager of the Maxwell House Division of the General Foods Corp., October 22, in Houston, Tex.

George Henry Battersby, 59, for the past 15 years manager of the San Antonio, Tex., branch of George A. Hormel and Co., October 29, at San Antonio. He was connected with the branch, as salesman and manager since its opening 33 years ago.

Isadore Cohen, 62, secretary-treasurer of the Atlas Baking Co., Richmond, Va., October 25, in Richmond.

Henry P. Crowell, 89, founder and president of Quaker Oats Co., Chicago, Ill., October 23, in Chicago. At the time of his death, Mr. Crowell was honorary chairman of the board.

C. E. Gray, chairman of the board of the American Dry Milk Institute and former chairman of the board of the Golden State Co., Ltd., September 19, in Oakland, Calif.

Roy L. James, 60, sales manager for Libby, McNeill & Libby, Chicago, for the past 23 years, November 5, in St. Petersburg, Fla.

Donald A. McArthur, 48, assistant manager of sales, Pacific Coast division, American Can Co., September 16, in San Francisco.

Allen Wilson Valentine, 51, vice-president of Valentine's Meat Juice Co., Richmond, Va., October 15, in Richmond.

ASSOCIATED INDUSTRIES

Allis-Chalmers Manufacturing Co. announces the appointment of A. J. Schmitz as Pacific regional manager.

American Can Co. has made Russell C. Taylor responsible for all the company's container manufacturing plants, both general-line and packers'. This consolidation follows the recent creation of a new department of research and development headed by James A. Stewart, vice-president of the company, who formerly was in charge of packers' can manufacture.

American Engineering Co. has elected Allison L. Bayles to the post of vice-president.

Borg-Warner has named Arthur P. Emmert as president of their Warner gear division. The company operates four plants at Muncie, Ind.

Continental Can Co. is opening a new packers' can district sales office in Philadelphia. The office will concentrate upon servicing customers in Pennsylvania and New Jersey. C. W. Smith has been appointed packers' can sales manager for the new district.

Frigidaire Division, subsidiary of General Motors, announces the appointments of G. W. Trask as sales manager of commercial and air-conditioning products, A. J. Pizza as sales manager of national user products and ice cream cabinet equipment and C. W. Kirby as appliance sales manager. All three will make their headquarters in Chicago.

Kehr Paper Products Co. recently was formed by A. B. Kehr for the design and manufacture of a complete line of protective-packaging products. The company's offices will be in Philadelphia.

Marco Co., Inc., Wilmington, Del., has appointed Dr. S. Henry Ayers as head of its research laboratory. For years, Dr. Ayers was connected with the research laboratory of the Department of Agriculture.

Marathon Corp. is the new name of Menasha Products. The company manufactures packages and packaging materials.

New Jersey Machine Corp. has established an office in Cincinnati, Ohio.

United States Rubber Co. has announced the appointment of Herman A. Everlien as general sales manager of the mechanical goods division. Walter F. Spoerl has been named merchandise manager.

Yarnall-Waring Co., Philadelphia, has opened a new southwestern sales office in Dallas, Tex. S. R. Edwards will be in charge of the new office.

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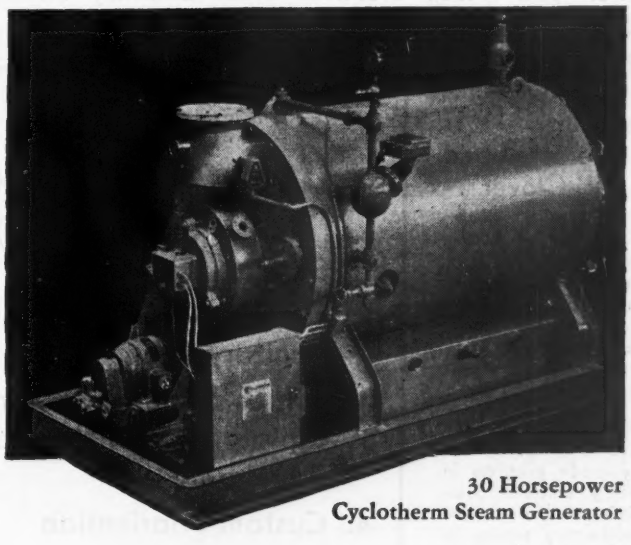
Detailed additional information will be supplied promptly upon request. Our engineers are available for consultation.



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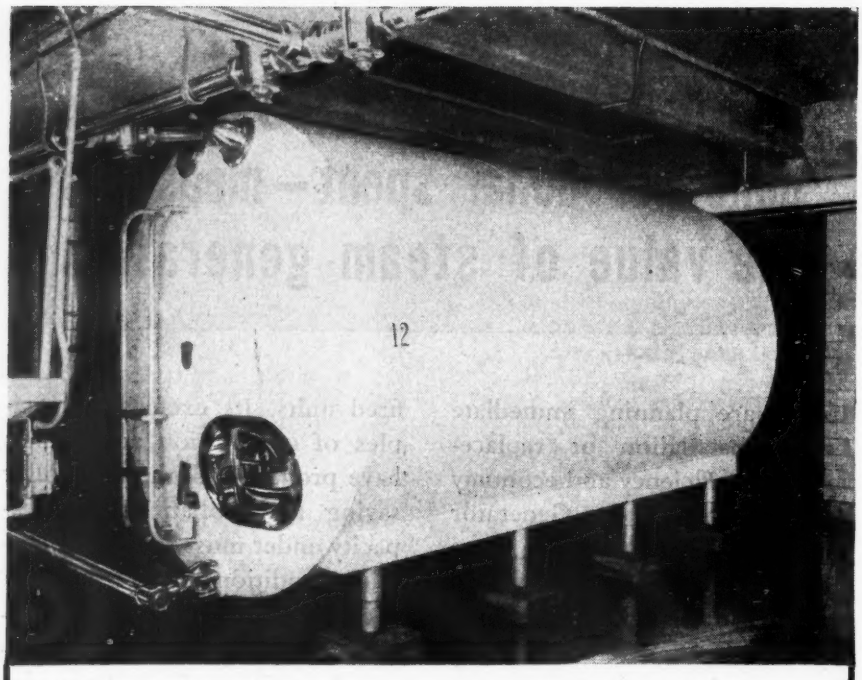

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Mandarin, Tangerine Oils

(*Continued from page* 85)

These limits evidently differ considerably from those of Italian and Brazilian mandarin oils. They conform, however, with the properties of samples which Fritzsche Bros., Inc., received from Florida and Brazil, labeled as tangerine oils.

A sample from Lake Alfred, Florida, labeled as tangerine oil, cold pressed 1943, had the following properties:

Specific gravity at 25°	0.845
Optical rotation at 25°	+92°30′
Refractive index at 20°	1.4748
Aldehyde content, calculated as decyl aldehyde	0.75 percent
Evaporation residue	3.3 percent
Color	Deep reddish-orange

Two samples of tangerine oil received from Brazil analyzed as follows:

	I	II
Specific gravity at 25°	0.847	0.846
Optical rotation at 25°	+96°10′	+94°40′
Refractive index at 20°	1.4748	1.4740
Evaporation residue	3.6%	2.8%
Color	Brownish-green	Dark brown

The odor and flavor of all these oils differed from that of Italian or Brazilian mandarin oils.

The Florida Oil

The chemistry of Florida tangerine oil (from Dancy tangerine) was investigated by Nelson[5] who identified the following constituents:

D-limonene—The principal constituent, amounting to about 95.75 percent of the total oil. α_D of the purified limonene 94.5 deg.; tetrabromide m.p. 104.5 deg.

Octyl aldehyde—Isolated as bisulphite compound; oxime melting point 57 to 58 deg. The presence of octyl aldehyde was confirmed by oxidation of the aldehyde to octylic acid and analysis of the silver salt.

Decyl aldehyde—Isolated as bisulphite compound; oxime melting point 66 to 67 deg. Oxidation of the aldehyde to decylic acid and analysis of the silver salt. Tangerine oil contains much less of octyl and decyl aldehyde than Nelson and Mottern[13] found in Florida grapefruit oil.

Citral (?)—By treating the terpeneless oil with sodium sulphite and sodium bicarbonate, a small quantity of a limpid yellow oil was isolated which possessed a pronounced citral odor. No crystallized α-citral semicarbazone could be obtained, probably because some other aldehydes, also forming a labile dihydrodisulphonic acid derivative, were present.

Linalool—Phenylurethane melting point 61 to 62 deg.; no depression of the melting point when mixed with an authentic sample; treatment with a 5 percent sulphuric acid solution gave terpin hydrate m.p. 116 to 117 deg. Oxidation of linalool produced an aldehyde with a typical citral odor.

Citronellol (?)—An alcohol with a rose-like odor was isolated. The diphenylurethane obtained from it was a liquid which indicated the presence of citronellol rather than geraniol.

Other unidentified alcohols—The alcohols in tangerine oil are present partly as esters, although the ester content of the oil is low.

Cadinene—In the fraction with a boiling point of 128 to 130 deg. at 10-mm. pressure, the presence of cadinene was indicated by a blue color when treated with acetic and sulphuric acids, but no crystalline hydrochloride can be formed. If cadinene is present, it is accompanied by other substances which prevent the isolation of cadinene dihydrochloride.

None of the unsaponified fractions showed any fluorescence, which indicates the absence of even traces of methylanthranilate in Florida tangerine oil.

When standing for a long time in a refrigerator, a yellow, partly crystalline material separates. This substance, named "tangeretin," was investigated by Nelson.[14] According to Goldworthy and Robinson,[15] tangeretin is 3,5,6,7,4′-pentamethoxyflavone, which they succeeded in synthesizing.

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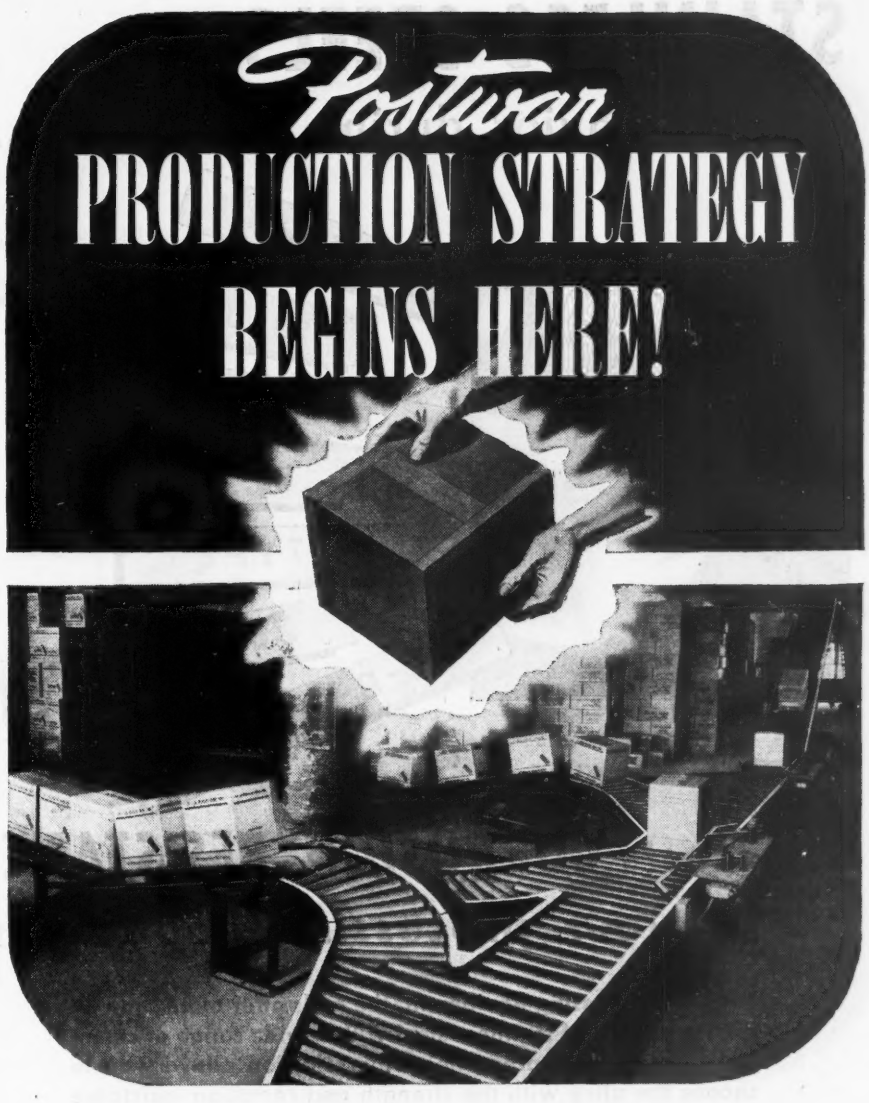
Trends in Sanitation

(*Continued from page 77*)

Good Lighting a Must

Establishments normally dependent upon daylight ought to be constructed so as to have an unobscured window or skylight area of not less than 25 percent of the floor space, so arranged that every part of the room receives light of not less than 10 foot-candles in intensity. Where artificial light is contemplated, the same minimum degree of light intensity should be available at all times, and for operations requiring any considerable visual control such as inspection of quality and color, a minimum of 30 foot-candles is desirable. Daylight type fluorescent and incandescent lighting, or normal white incandescent illumination, is preferable to mercury-vapor lamps, which are prone to cause color dis-



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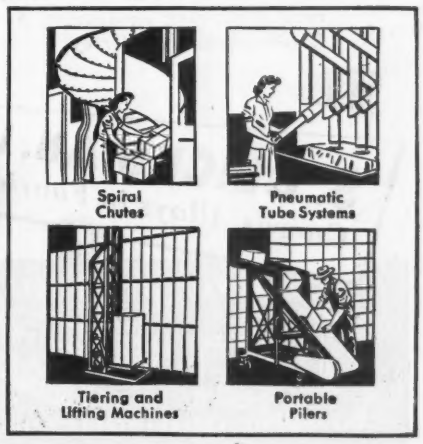
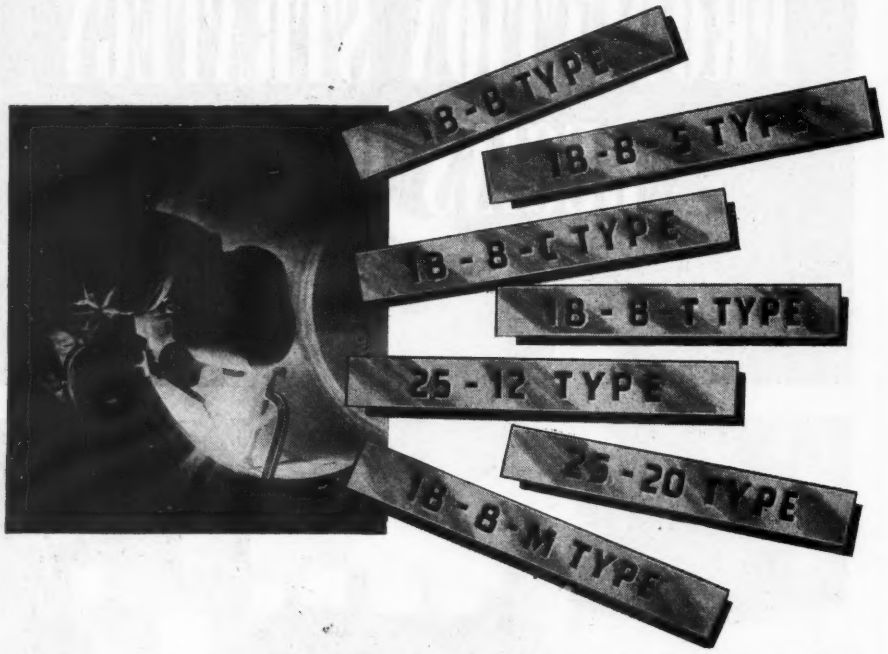


STAINLESS STEELS

Their behavior during fabrication...



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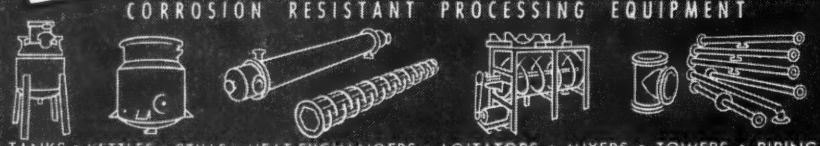
CORROSION RESISTANT PROCESSING EQUIPMENT



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tortions in products being processed.

In certain types of food plants, the natural movement of air due to convection can be made sufficient for satisfactory ventilation by adjustment of windows, transoms, ceiling vents and doors. Where air conditioning or forced-draft systems are used, they should be so constructed as to permit easy access for cleaning of accumulations of dust and grease, and the intake should be so located and constructed as to prevent the sucking in of smoke, dust and other undesirable contaminating materials.

Watch the Piping

Adequate and properly installed plumbing is an often neglected factor in food-plant construction. Potable water installations must be so constructed that permanent water outlets, hoses and other temporary outlets cannot be immersed or come in contact with the contents of tanks, washers, sinks, sumps or other equipment, thereby eliminating the possibility of water-supply contamination through back syphonage. Under no circumstances should there be any cross connections or other hookup between potable water supplies and water of an unknown quality. Sewer or other waste pipes ought not to cross over any area where foods are stored or processed. All piping should be covered in such a manner as to prevent contamination of foods by condensation and drip, and where necessary, easily cleaned and properly drained drip trays should be installed. The use of lead pipe for conveying water, foods or food materials is not to be tolerated. Where private wells are used, they ought to be constructed with tight casings and crowns in such a manner as to prevent contamination by ground seepage, flooding and vermin. The sanitary quality of the water must be checked before use and at frequent intervals to insure freedom from contamination.

Waste systems should be connected to an approved type of sewage disposal system. Where this is not feasible, proper septic tanks or leaching basins ought to be constructed. Fly and mosquito-breeding nuisances, as well as grossly insanitary disposal methods, are often encountered in country-located plants. In some instances plant waste has been permitted to flow by gravity from a pipe to an open cesspool or ditch.

Pest Preventives

In the planning of new food plants, the architect must take into consideration rodent-proof and insect-proof designs and materials.

Hollow walls and closed spaces under shelving, tables and other equipment must be avoided to eliminate insect and rodent harborage or breeding places. It is important that wall openings around pipes and conduits be tightly closed with rodent-resistant material, or be protected with metal shields.

Metal-lined storage rooms and food receptacles with tightly fitting covers also are essential for the prevention of contamination of the contents by insects or rodents, and all doors and windows should be constructed so they can be properly screened.

Employee Cleanliness

Sufficient toilet facilities must be provided for employees of both sexes. Toilet rooms should be so located as not to open directly into any room used in the handling or preparation of food, and they ought to be ventilated directly to the outside air by means of transoms or windows, and if the latter cannot be accomplished, ventilation by means of mechanical systems or ducts may be considered.

The toilet room can be connected to an interposing room which may be used as a utility room—not used for food-handling purposes—such as a dressing room, lounge or locker room, if self-closing doors are provided for each room.

An adequate number of lavatories with paper towels and soap dispensing devices is a basic necessity in each toilet room. The provision for a sufficient number of conveniently located lavatories throughout the plant is also essential in order that employees contaminating their hands with filthy materials may have easy access to hand-washing facilities before they again handle food products.

Equipment Design

No part of any equipment that comes in contact with food products should be composed of antimony, cadmium or lead alloys. Smooth seams with rounded joints and corners and satisfactory drainage are necessary for proper cleaning, and all pockets, recesses and dead-ends should be eliminated. All piping ought to be in short, easily dismounted lengths, with tight seams and sanitary type fittings, so connected as to permit easy removal for cleansing. Valves, pumps and other accessory equipment also should be so assembled that all parts with which food comes in contact can be taken apart easily and cleaned. Metal rotary seals are recommended in-

SODIUM FERRIC PYROPHOSPHATE

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helped this Ultra-Modern Bakery Achieve Greater Production . . . AT LOWER COST!

● Having outgrown several buildings in its long and progressive history, the Strietmann Biscuit Company of Cincinnati set out, before the war, to erect the most modern and efficient plant that could possibly be built. Lamson engineers cooperated from the time the first blueprints were being prepared.

● The result is a notably efficient production unit, with materials moving uninterruptedly from the receiving department, until they are delivered as finished products to the shipping platform. The flow of cartons is synchronized with the flow of goods, and both can be easily regulated. Provision has been made at every point for changes in size of cartons, and for shifting from dump-pack to hand-pack, as required.

● A detailed description of this superb plant appears in the "Lamson Conveyor" for December, 1943. If you would like a complimentary copy, please fill in and mail the coupon below.

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This new Utility Conveyor . . . portable, adjustable, reversible . . . is a packaged conveyor unit that needs only to be plugged into your electric circuit.

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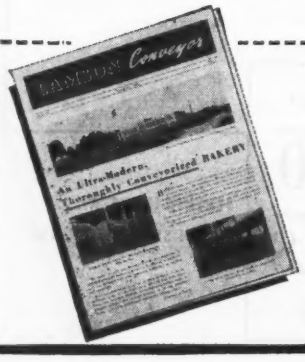

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Please send me a copy of the "Lamson Conveyor" describing the conveyor system in the Strietmann Biscuit plant.

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Company .....

Address .....

stead of the conventional type of unsanitary stuffing boxes.

In locating equipment, it should be spaced so as to permit easy access to all parts and to the floors and surrounding walls to allow satisfactory cleaning. It is preferable that all stands upon which equipment rests be equipped with ball-type feet and be of sufficient height to permit sweeping and washing of the floor underneath. Certain types of heavy equipment necessarily must rest on solid bases. These bases must be tight at their junction with the floor so as to prohibit the seepage underneath of water and other liquids.

A sufficient number of steam and hot and cold water outlets, as well as wash tanks large enough to accommodate sanitary piping lengths and other equipment, should be conveniently located in all processing rooms.

The entire food plant and every piece of equipment in it has a definite bearing on the physical and sanitary quality of the products produced or processed. Improper structural planning or inadequate or misfit equipment is economically unsound and results in trouble.

The application of these objectives in plant and equipment planning will be conducive not only to better plant efficiency but to products of higher quality.

Flash Pasteurization Best for Apple Juice

SCIENTISTS at the New York State Agricultural Experiment Station, at Geneva, N. Y., engaged in the development of improved fruit juices, assert that either cloudy or clarified apple juice—they strongly object to calling it "apple cider"—can best be preserved by flash pasteurization.

This flash pasteurizing process consists of holding the apple juice in bottles or cans for a period of 1 minute after filling at a temperature of 170 to 175 deg. F., inverting the containers or turning them on their sides for 3 minutes, then cooling them rapidly.

By this method, much of the original aroma, flavor, and appearance of the freshly pressed apple juice is retained, according to the Experiment Station specialists.

Details Available

A circular describing the flash pasteurizing process for both large-scale and small-scale operations may be obtained by food processors upon request to the Experiment Station.

FOOD EQUIPMENT NEWS

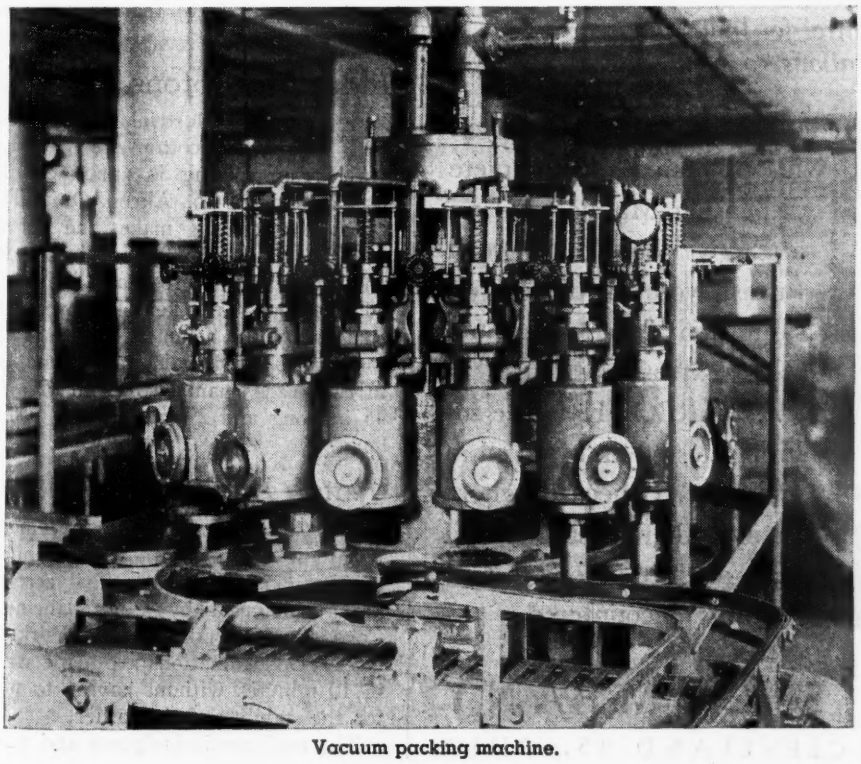
Package Piler

CAPABLE of unloading 500 to 600 cases per hour, the Ultimate Package Piler and Stacker made by Island Equipment Corp., 101 Park Ave., New York 17, operates on an endless chain with hangers or package holders. It accommodates all standard-size canner's cases up to 8 lb. in weight. The upright member on which the endless chain moves clockwise rests on a base equipped with swivel-type ball bearing castors so that the unit can be moved about quite easily.

Vacuum Capper

VACUUM of 29 in. is drawn on 150 jars or more per minute by the 16-stage Fastpak vacuum machine developed by Thatcher Manufacturing Co., Elmira, N. Y. Development of the vacuum in 16 stages eliminates undue disturbance of the contents of the containers, yet the action is continuous and nonstop in operation. When the machine is used on screw caps, each cap is gripped by the unit, and after the vacuum is drawn the tightening of the cap is completed by the machine.

The company states that the machine can process jars ranging in height from 4 to 7 in., and that the production rate can be regulated as conditions demand. Jars are fed into the capper on a conveyor and are discharged by a rotary disk. This vacuum machine can be used on such foods as coffee, salad dressing, mayonnaise, dried beef, vegetables, pickles and relishes, and peanut butter.



Vacuum packing machine.

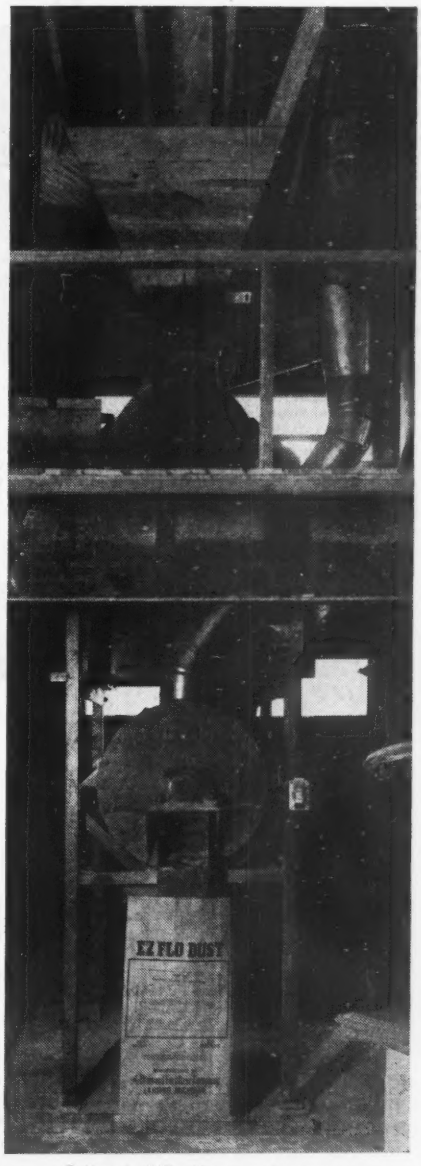
Intimate Blending Unit

APPLICABLE to mixtures of powders finer than 100 mesh, or to mixtures of fine powders with liquids to give a dry free-flowing product, where a degree of homogeneity is essential, an intimate blending unit has been developed by Sprout, Waldron & Co., Muncy, Pa.

Included in the system are a sifter to eliminate compacted lumps in the feed, resulting from storage, and this is followed by a brief premixing in the conventional manner. Where a liquid is to be included, it is sprayed from a manifold during premixing.

There follows a thorough violent agitation of the premix as it passes in a thin layer through a high-speed disk blender which insures positive intimate dispersal of very small persistent clumps.

The blender products drop to an agitated aerator-mixer which maintains free-flowing characteristics quickly lost when such powders are allowed to settle. It also acts as a storage reservoir for sacking. When a small amount of such a blend is pulled out into a thin layer under a spatula it is found virtually free from streaks or spots, the manufacturer states.



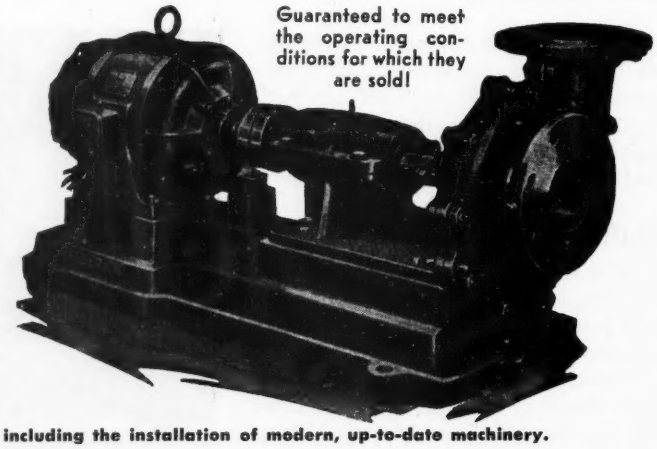
Intimate blending equipment.

Insulating Fiber

BALSAM-WOOL K-25, a new insulating fiber for locker and cold storage plants, has been announced by Wood Conversion Co., First National Bank Bldg., St. Paul, Minn. This insulation is a fill type, and is shipped in bales to the job, where it is fluffed to a low density and then hand packed into walls, floors and ceilings. When packed into the wall, its density is from 3½ to 4 lb. per foot and it is said to retain a certain amount of resiliency, thus

"FREDERICK" PUMPS . . .
MADE *WELL* TO MAKE *GOOD*

Post war industry cannot go back to the "good old days." Increased manufacturing costs . . . higher wages . . . developed in war time production, are here to remain for an indeterminate period. More efficient manufacturing procedure — also a war time development — has kept pace with the mounting cost of production and has tended to hold prices stable.



Guaranteed to meet the operating conditions for which they are sold!

To keep prices from soaring in the post war era, it will be necessary to continue the practice of war time economies, including the installation of modern, up-to-date machinery.

FREDERICK, a manufacturer of fine pumps for over 25 years, offers a product which delivers the consistent excellent performance demanded by post war industry. FREDERICK can supply you with the *right* pump for every process need. The design and construction features of FREDERICK pumps insure trouble free, top performance, with no costly time-losing shut-downs, the result of unnecessary breakdowns. Write for literature . . . there's no obligation.

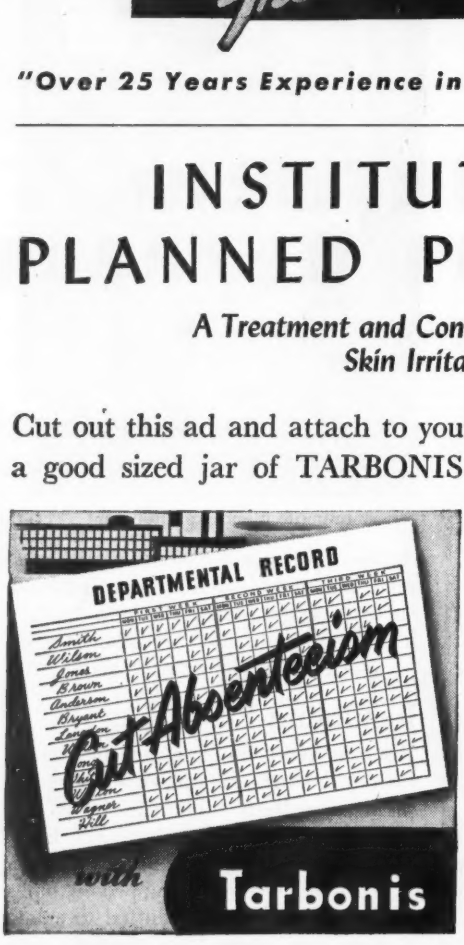
THE Frederick IRON & STEEL CO.
Frederick, Maryland

"Over 25 Years Experience in the Making of Fine Pumps"

INSTITUTE OUR PLANNED PROCEDURE

A Treatment and Control for Industrial Skin Irritations

Cut out this ad and attach to your letterhead. It will bring you a good sized jar of TARBONIS without charge, a complete dispensing Manual and an attractive booklet we can furnish your employees on sanitation and precaution. Why experiment further? . . . TARBONIS is the solution, tested and proven in Industry . . . succeeds where many other methods fail . . . against a long list of irritants encountered.

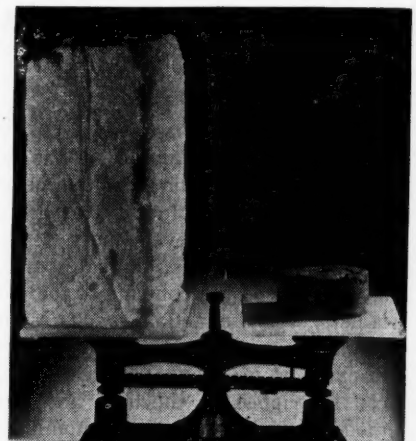


THE TARBONIS COMPANY
1220 HURON ROAD • CLEVELAND 15, OHIO

eliminating the settling problem. A special asphalt impregnation adds to the natural moisture resistant characteristics of the fiber and also eliminates wick action. The insulating material is made of clean, new wood, resulting in soft nonirritating fibers.

Plastic Foam

WEIGHING only one-seventh as much as cork, plastic foam has been developed by United States Rubber Co., Rockefeller Center, New York. It has great buoyancy, yet is semirigid. Because it contains so much air space, it has good insulation and sound-deadening properties. It weighs less than 1⅛ lb. per cubic foot and can be made



Plastic-foam insulation.

to weigh as little as ¾ lb. It is made of a combination of synthetic plastic materials which are foamed and then solidified.

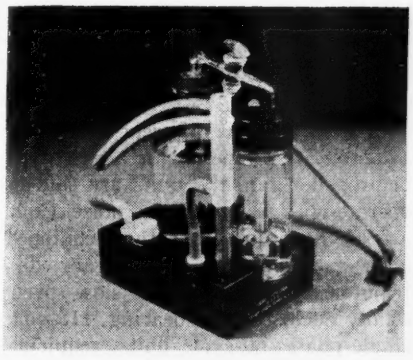
Industrial Aprons

LIGHTWEIGHT industrial aprons made with high-grade cotton fabric and a vinyl resin coating is announced by B. F. Goodrich Co., Akron, Ohio. The vinyl resin coating makes the aprons waterproof, acid-proof, alkali-proof and oil and grease resistant, it is said. The aprons are flexible, are constructed with hemmed edges, reinforced neck and waist tapes, and are in two sizes; namely, 35 in. wide by 45 in. long and 29 in. wide by 35 in. long.

Water Analyzer

USING the foam-meter principle in determining end point, a convenient, rapid, air-agitated water analyzer has been announced by Chief Chemical Corp., 1123 Broadway, New York 10, N. Y. Determinations are made within 10 minutes without having to wait for the stability of the lather.

The analyzer is foolproof and gives



Air-agitated water-analysis unit.

identical results with different operators, the manufacturer states. Samples of 50-ml. or less are required.

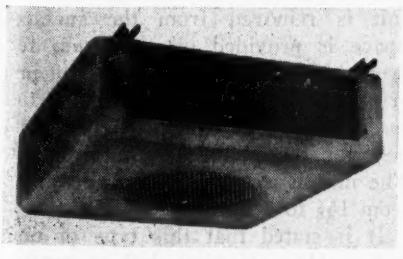
The instrument is supplied calibrated and ready for assembly and use. There are no moving parts to get out of adjustment. All parts are of durable plastic construction. The apparatus functions well in the presence of interfering substances such as chlorides up to 2,000 p.p.m.; sulphates up to 1,000 p.p.m. are also without effect. Large iron concentrations and the treating and conditioning chemicals and compounds used in boiler waters do not interfere.

Photoelectric pH Meter

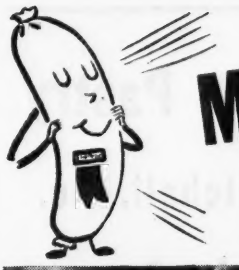
PHOTOVOLT CORP., 95 Madison Ave., New York 16, has developed a new photoelectric pH colorimeter, Model 400-A. The manufacturer states that it is accurate, direct reading and designed for operation with ordinary full-length Pyrex test tubes. A sliding test tube carrier permits convenient checking of the setting at any time, and ample reserve is provided to reach full-scale deflection even for dark solutions. Being equipped with a complete set of six color filters, the instrument, in addition to its application for pH measurements, can be used for all colorimetric and turbidimetric tests in chemical analysis.

Ceiling Coolers

TO MEET the demand for cleanliness and attractive appearance in ceiling-type horizontal coolers for cold rooms and large refrigerators, a new series of Spasaver air coolers housed in streamlined white enamel cabinets,

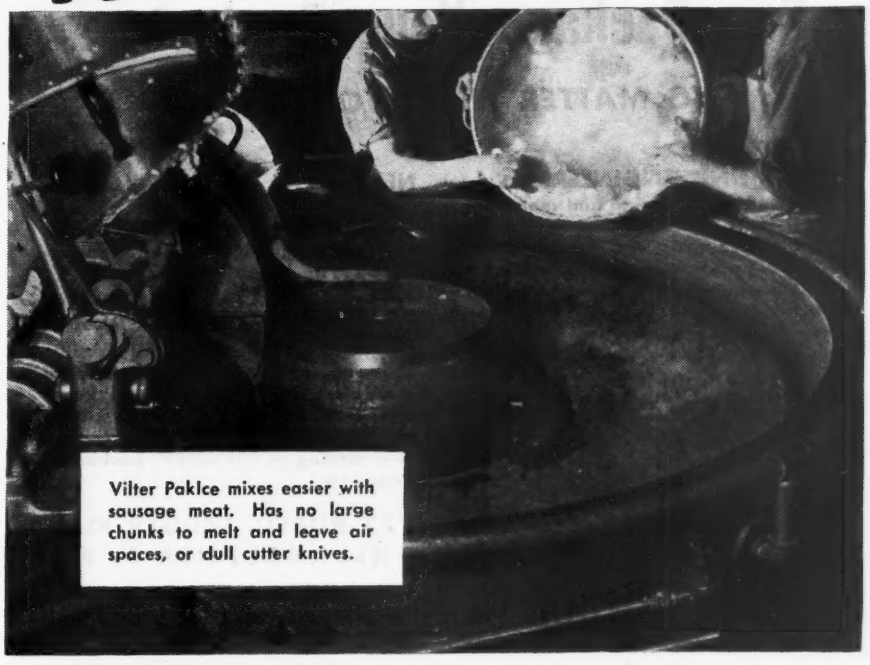


Ceiling-type horizontal cooler.



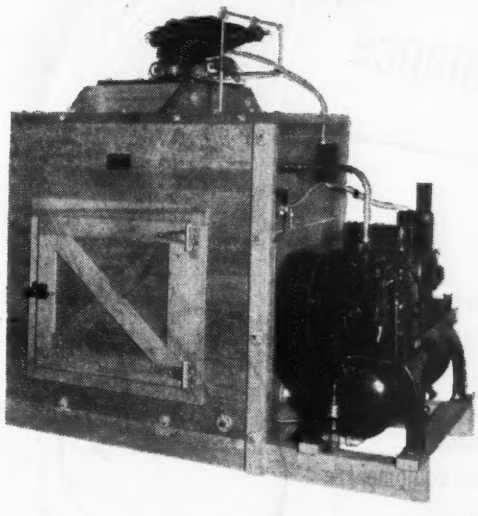
Make Better Sausage

with VILTER PAKICE equipment...



Vilter PakIce mixes easier with sausage meat. Has no large chunks to melt and leave air spaces, or dull cutter knives.

Crystalform PakIce, produced in your plant at costs as low as $1.50 per ton, in capacities from ½ ton to 30 tons per day from a *single unit,* has many advantages over ordinary ice. It's ready where and when you need it; easier to handle in any quantity, avoids crushing costs and meltage losses, and requires very little floor space.



But even more important to sausage makers — PakIce has no large chunks to melt and leave air spaces when mixed with meat, and that means better sausage. Cutter knives last longer, too, for PakIce, soft as snow, has no hard lumps to dull knives.

Meat packers and sausage makers everywhere have cut their ice costs as much as 50% and more with Vilter PakIce. This one factor alone will pay for a Vilter PakIcer in your plant.

Vilter 1-ton self-contained PakIcer. Other models available in daily capacities from ½ ton to 30 tons in 5-ton increments — to fit all needs.

Write for the MONEY-SAVING FACTS on Vilter PakIce Equipment!

Superior Since 1867 VILTER Air Conditioning Refrigeration...

ARMY E NAVY

The VILTER MANUFACTURING CO.

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Pears, Pickles, Pretzels or Pastry

PACKAGING DIVISION E. W. Twitchell, Inc.

Can Package Your Product

. . . NO MATTER WHAT YOU MAKE

PACKAGING ENGINEERS Our facilities include design and manufacture of stock or special wrappings and packagings. We have solved many a packaging problem — if you have an out-of-the-ordinary product — difficult to wrap or package, let us show you how best to dress it up for the consumer.

PACKAGING HEADQUARTERS Our organization is headquarters for every type of food packaging. We are *packaging specialists.*

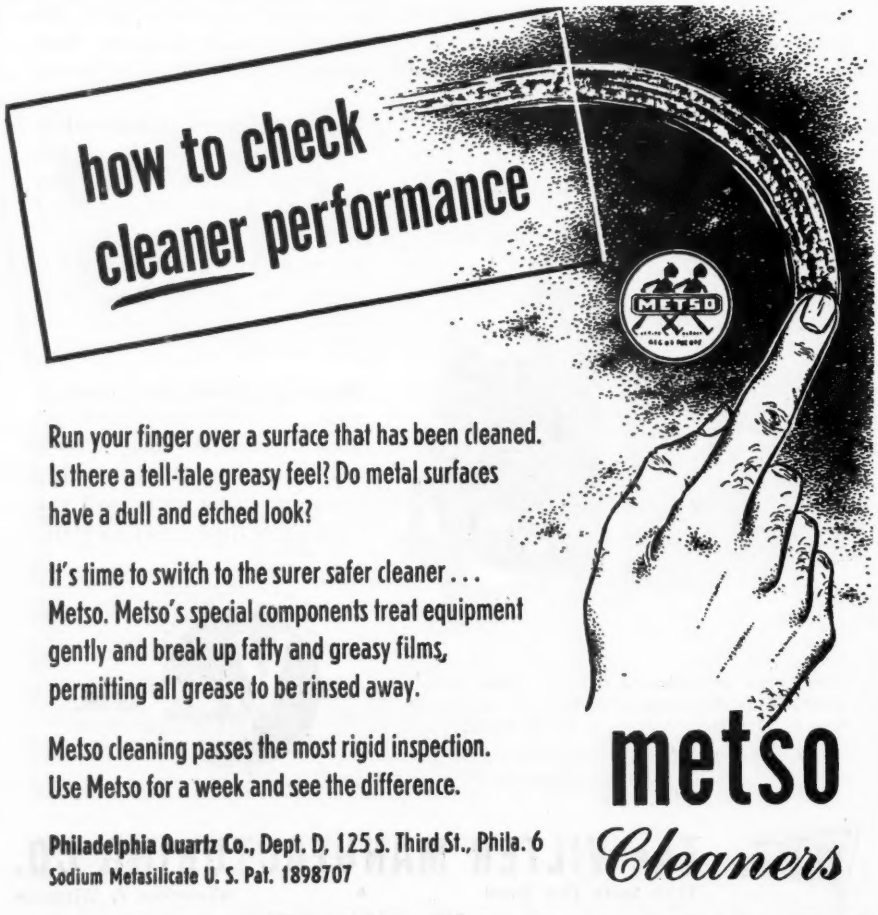
Packaging Division
E. W. TWITCHELL INC.

NEW IDEAS We sponsor novel presentations. We are sales minded — and create eye catching packagings that move goods. Consultation invited . . . no obligation.

FROZEN FOODS PACKAGING MATERIALS Our "PAKSURE" line of wrappings, bags and cardboard containers for storing fruits, vegetables, meats, fish and poultry covers every need in this field. Send for our new catalog of "PAKSURE" packaging materials.

777 PUBLIC LEDGER BLDG.
PHILADELPHIA 6, PA.

"Specialists in Special-Purpose Paper Packagings"



Run your finger over a surface that has been cleaned. Is there a tell-tale greasy feel? Do metal surfaces have a dull and etched look?

It's time to switch to the surer safer cleaner . . . Metso. Metso's special components treat equipment gently and break up fatty and greasy films, permitting all grease to be rinsed away.

Metso cleaning passes the most rigid inspection. Use Metso for a week and see the difference.

Philadelphia Quartz Co., Dept. D, 125 S. Third St., Phila. 6
Sodium Metasilicate U. S. Pat. 1898707

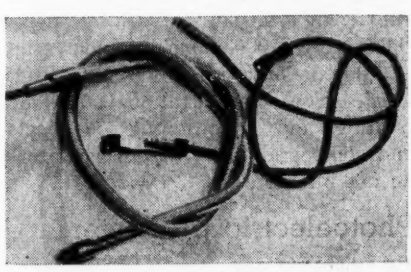
metso
Cleaners

suitable for all refrigerants and ready for installation, is offered by Drayer-Hanson, Inc., 738 East Pico St., Los Angeles 21.

Models in ten different sizes are available. Equipped with a new type of propeller fan, the units are said to operate with practically no noise. Coils are of the fin-and-tube type, equipped with a kinetic-type refrigerant distributor. Motors are slow-speed, totally enclosed, ball bearing, 115-volt, single-phase, 60-cycle units, requiring no lubrication after leaving the factory.

Flexible Electric Heater

BECAUSE it can be coiled around pipes and cylinders and fitted to odd contours, the new flexible Serpentine electric heater perfected by H. & A. Manufacturing Co., Inc., Buffalo, N. Y., is suited to special applications.



Flexible metal-ceramic electric heater.

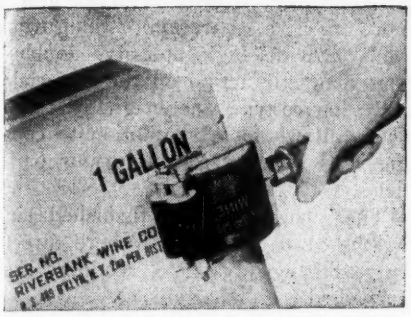
Made of metal and ceramic material, the heater can be had in varying lengths and diameters and in capacities of as high as 20 watts per lineal inch. Heat may be applied through direct contact of the unit or may be transferred through clips or fixtures of various designs. The unit may be left exposed or may be sealed or coated over with the insulating materials.

A typical application is the heating of pipes or valves carrying viscous fluids.

Printing Roller

AUTOMATIC return of the printing roller to the starting position makes for speed in using the Rolamarker to imprint on boxes, cases or crates the manufacturer's trademark, name of product or contents. The return mechanism operates immediately after the unit is removed from the surface. Space is provided on the drum for overtravel, so that more than one imprint may be made if desired, and the assembly may be equipped with channels for interchangeable information. The unit is available to imprint areas from 1⅝ to 4 in. to 9 by 15 in.

It is stated that this type of unit will enable a shipping clerk to imprint from 8 to 12 cases in the time ordi-



Printer with resetting roller.

narily required to stencil one. The imprinter is available at Adolph Gottscho, Inc., 190 Duane St., New York 13.

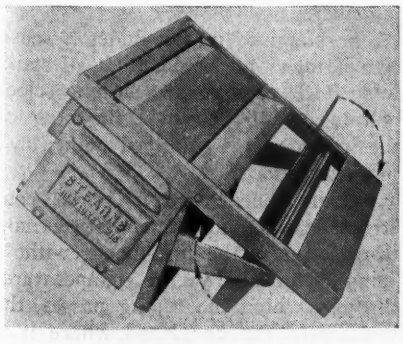
X-ray Spectrometer

NORTH AMERICAN PHILIPS CO., INC., 100 East 42nd St., New York 17, has introduced a new Geiger counter X-ray spectrometer. This instrument is said to provide an extremely accurate means of measuring distribution and intensities of X-ray reflections. It provides a rapid method for directly determining location and intensity of diffracted rays. The intensity measurements are quantitatively accurate and can therefore be used to determine the composition of crystalline mixtures. It is further said that quantitative analyses of mixtures can be made in a matter of minutes. Power for the spectrometer is taken from a 115-volt, 60-cycle a.c. outlet. The overall dimensions of the unit are 30 in. wide by 44 in. long by 44 in. high.

Spout-Type Magnet

DESIGNED for the milling, feed and grain industries, a new spout-type magnet announced by Stearns Magnetic Mfg. Co., Milwaukee 4, Wis., will protect crushers, grinders and other machinery by removing tramp iron from the material being handled.

The tramp-iron discharge gate is of "clean" design to prevent dirt from collecting and hindering operation and a positive, quick-acting armature insures opening and closing of the gate.



Spout-type magnet.

HOW DOES HACKNEY VOLUME DECREASE YOUR COSTS?

● Pressed Steel Tank Company's volume makes possible the production of better products—products which give you longer, lower-cost service.

Hackney Drums and Barrels are giving you the benefits of the chemical and metallurgical research utilized in the selection and testing of raw materials. They provide the advantages of uniform size, weight, strength and capacity maintained by modern heat-treating and quality control equipment. Light in weight, they assure the economies resulting from Pressed Steel Tank Company's more than 40 years of experience.

At Pressed Steel Tank Company, we are busily engaged in making war products. But as soon as war restrictions can be relaxed and there is more material available for civilian needs, Hackney's product development work and volume manufacturing will be at the disposal of *every* concern.

Pressed Steel Tank Company

MANUFACTURERS OF HACKNEY PRODUCTS

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Milwaukee 14, Wisconsin

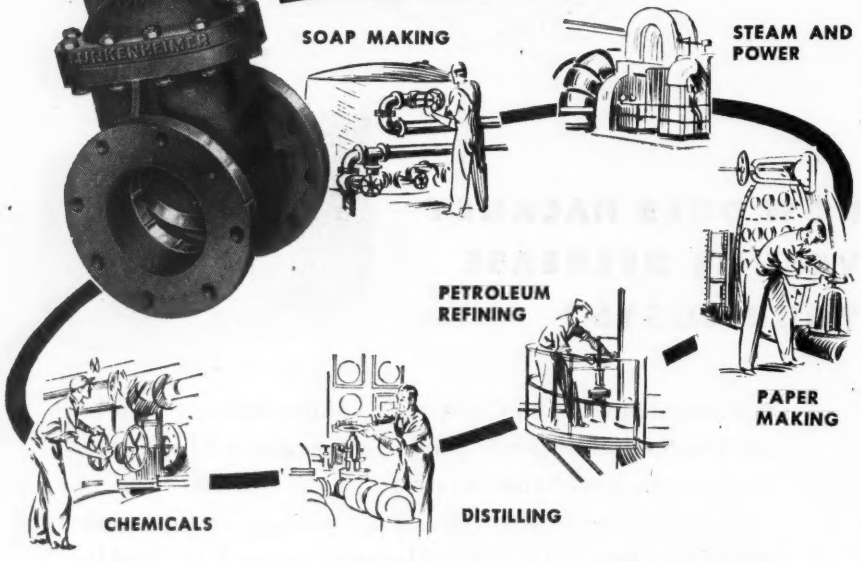
CONTAINERS FOR GASES, LIQUIDS AND SOLIDS

Write today for full information

WARTIME SERVICE HAS BEEN *TOUGH* ON VALVES

but not too tough for LUNKENHEIMER

Built-in quality



With production geared to tremendous volume, valves have taken a real beating during the war. It's been a gruelling test . . . of quality . . . of ability to *stay tight* under all service conditions.

In this severest of tests, Lunkenheimer Valves have proved their worth by giving consistent maximum service with a minimum of trouble and maintenance expense.

Simplicity of design and engineering "know how" are responsible for the exceptional record established by Lunkenheimer Valves on every wartime front—industrial and military.

In coming peacetime, as during the past three-quarters of a century, a solid assurance of top economy and performance lies in Lunkenheimer built-in *lasting* quality.

Lunkenheimer Distributors too have measured up to a tough assignment... to keep their vitally needed service channels open despite almost insurmountable handicaps. The facilities of this nationwide organization are at your service always.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI 14, OHIO. U. S. A.
NEW YORK 13 CHICAGO 6
BOSTON 10 PHILADELPHIA 7
EXPORT DEPT. 318-322 HUDSON ST., NEW YORK 13, N. Y.

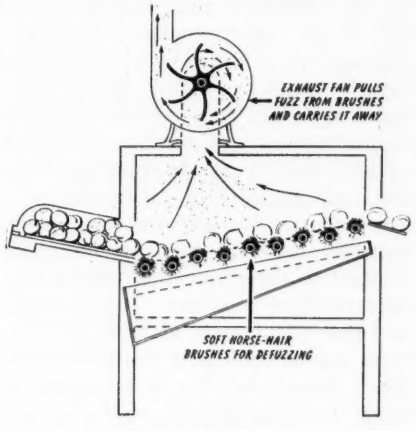
BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S.P.; BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS

An improved, stronger magnet gives more effective separation. Tramp iron wells provide high-intensity, double-pass magnetic action on the material, and louvre-type, nonmagnetic side plates allow ample ventilation to cool the coils but keep out injurious particles.

The magnets are furnished in widths of 8 to 20 in. Where direct current is not available, rectifiers are furnished.

Peach Defuzzer

FOOD MACHINERY CORP., Riverside, Calif., has developed a machine for defuzzing peaches. Peaches are fed into the defuzzer onto a series of cylindrically shaped, soft horsehair brushes, each of which revolves at a different speed and is at a different elevation. Thus, one brush will act as



Peach defuzzer.

a temporary brake, holding a peach and revolving it while another brush defuzzes it. The fuzz is drawn off by an exhaust fan.

Requiring a space of 5 × 6 ft., the machine is powered by a 1 hp. motor.

Locker Thermometer

RECORDING thermometers in frozen food locker plants are required by law in some states, and in several others such legislation is being contemplated, so Taylor Instrument Cos., Rochester 1, N. Y., has developed a special locker-room recording thermometer.

The standard unit includes a sensitive stainless steel bulb, 10 ft. of stainless steel tubing, an electric clock motor, and 100 charts. The door of the instrument is equipped with a cylinder-type lock.

Because the recorder is so constructed that bulb temperatures are transferred to the instrument without being affected by the temperatures through which the tubing passes, the instrument can be placed where it is readable from the street, if desired.

MATERIALS

Paint Remover

A WATER-SOLUBLE paint stripper has been developed by Turco Products, Inc., 6135 South Central Ave., Los Angeles, Calif. According to the manufacturer, the hosing off of an application of this stripper leaves a clean surface requiring very little after-treatment to prepare for further processing.

Known as Stripper L-780, it is claimed to be noncorrosive on metals, making it safe for use on machinery. It is said to be safe on wood, with no tendency to cause warping, and is non-inflammable. Because this stripper is water soluble, brushes and cleaning equipment can be cleaned for reuse quickly. Surfaces which are oily or covered with road film need no precleaning before applying the stripper. Applied with a brush or spray, the material is left on the surface for 5 to 20 minutes. The loosened paint is then scrubbed with a water saturated brush to form a slurry, which is removed by hosing.

Export-Case Adhesive

SPECIAL CERTIFIED grade B adhesive for sealing V-2S export shipping cases has recently been developed by H. B. Fuller Co., St. Paul, Minn. According to the manufacturer this adhesive meets all Army and Navy contract specifications. This product was developed especially to seal V-2S cases. The product comes in liquid form, ready to use, and can be applied either by hand or machine.

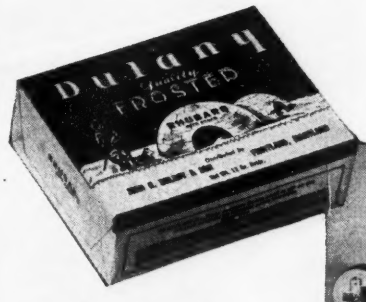
Synthetic Resin Adhesive

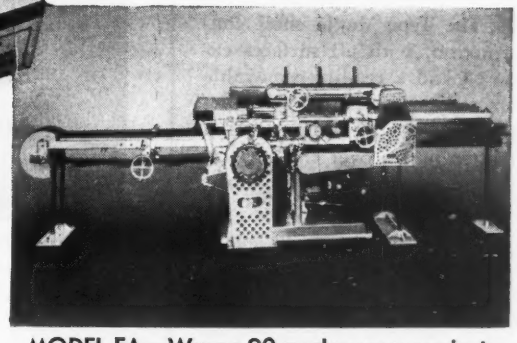
PLIASTIC Cement is the name of a new synthetic resin adhesive announced by Paisley Products, Inc., 1770 Canalport Ave., Chicago 16. In appearance, it is a soft, white, fluid cement that may be used in its natural state or reduced with water. Application is by brush, gumming machine, spreader, dipping, flow or spray gun. The adhesive is compounded of resin bases with non-resin materials to yield a tough, pliable, continuous film capable of joining many combinations of materials, the manufacturer states.

When dry, Pliastic is a semitransparent, glossy, flexible coating said to have excellent heat-sealing properties. When used in the liquid state for bonding materials, it can be applied to one or both surfaces, the speed of setting being dependent upon the porosity of the materials used. It comes in 1, 5, 30 and 55 gal. containers.

Fast, Perfect Wrapping of

FROZEN FOODS





MODEL FA—Wraps 90 packages per minute

Wraps food before or after freezing

Quickly adjustable for a wide range of sizes

Uses any type of wrapping material

Most accurate electric-eye registration

Advanced sealing mechanism assures perfect, tight seal

If packaging is your bottle-neck, you'll certainly appreciate this machine. In plant after plant it has proved to be the answer to the need for faster, more dependable wrapping. It is now the most widely used wrapping machine in the entire packaged-goods field.

The FA will wrap up to 90 packages per minute with one operator. Is suited to automatic conveyor or hand feed.

Handles the package on an even plane throughout the entire wrapping process. Bulging cartons are pressed back into shape, and they hold their shape because of the firm, tight seal produced.

Write for our Leaflet on Wrapping Frozen Foods

PACKAGE MACHINERY COMPANY
Springfield 7, Massachusetts

30 Church St., New York 7 • 111 W. Washington St., Chicago 2
101 W. Prospect Ave., Cleveland 15 • 443 S. San Pedro St., Los Angeles 13
32 Front St., W., Toronto 1

PACKAGE MACHINERY COMPANY
Over a Quarter Billion Packages per day are wrapped on our Machines

CROCKER-WHEELER POWER for FOOD INDUSTRIES

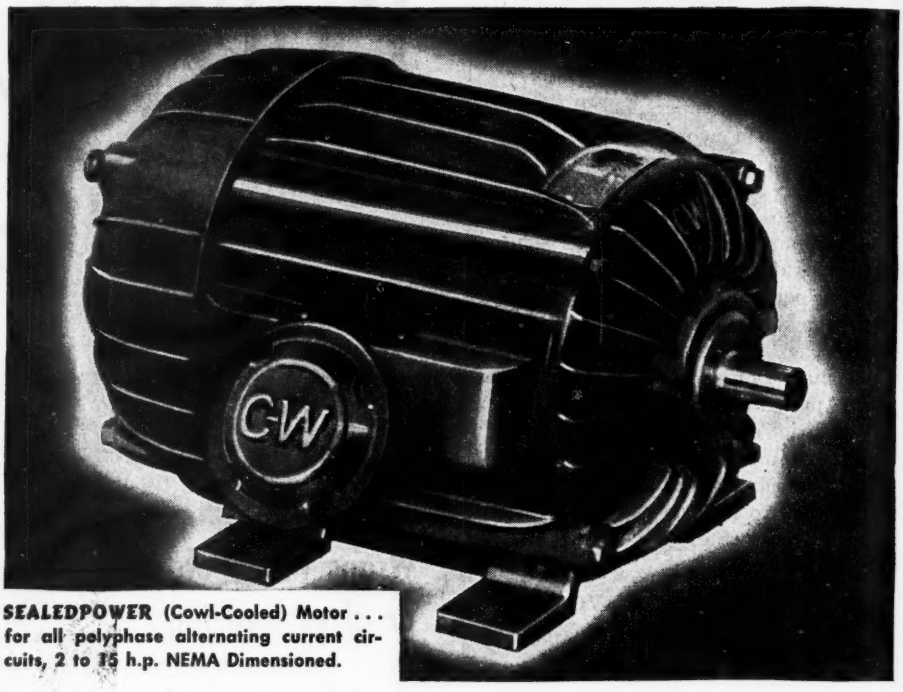
FEATURES

1. Totally Enclosed Cowl-Cooled type minimizes fire hazard, resists corrosion. Protects against acid or alkali fumes, splashing or dripping corrosive liquids, air-borne moisture, steam, corrosive gases, conducting dusts, metallic chips, lint, etc.

2. Fin Type single shell construction, with all surfaces exposed and a readily removable fan shroud, gives non-clog ventilation. Easy to clean...foreign matter passes over the surfaces of and not through the motor.

3. Patented GROOVSEAL antifriction bearings—no greasing needed for at least a year—minimizes maintenance. Seal permits use of softer grease, for better lubrication and longer bearing life.

4. Vacuum Impregnation with high grade insulating varnish seals out foreign matter and moisture from each individual coil...makes windings a homogenous mass... reduces hot-spot temperature and lengthens insulation life. Adherence of varnish prevents vibration of wires inside or outside of slot.



SEALEDPOWER (Cowl-Cooled) Motor... for all polyphase alternating current circuits, 2 to 75 h.p. NEMA Dimensioned.

THE FOOD INDUSTRY has many applications where the **SEALEDPOWER** motor is used... in dehydration... in quick-freezing... in canning... in packaging.

The design of this motor protects it against dripping or splashing liquids, and it may be washed down with a hose without injury to the windings.

Being completely enclosed, it prevents the entrance of insect pests or foreign matter.

In addition to the **SEALEDPOWER** motor, Crocker-Wheeler builds a complete line of AC and DC motors and generators for all food processing and handling applications.

As power specialists, Crocker-Wheeler field engineers know the power needs for your industry—of your particular production processes.

Call in one of our experienced field engineers for specific advice on motors, generators, couplings and control... no obligation.

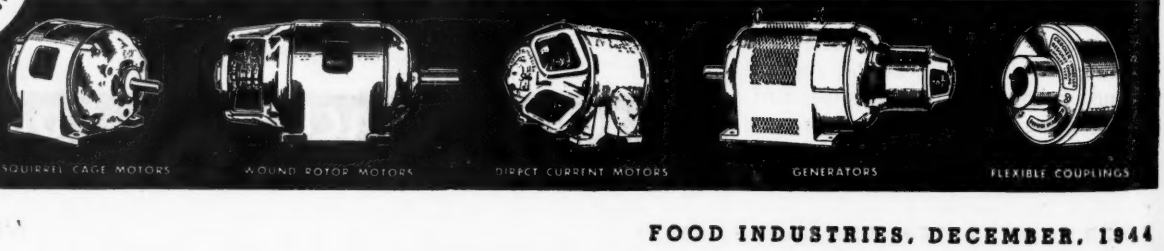
CROCKER-WHEELER

A Division of

JOSHUA HENDY IRON WORKS

AMPERE, NEW JERSEY

Branch Offices: BOSTON · BUFFALO · CHICAGO · CINCINNATI · CLEVELAND · DETROIT · NEW YORK · PHILADELPHIA · PITTSBURGH · SAN FRANCISCO · WASHINGTON · LOS ANGELES



CATALOGS & BULLETINS

FOOD PLANT EQUIPMENT

Soybean Processing Plant—"Industrializing the Soybean" is the name of a new 8-page bulletin, B6258, issued by Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. This bulletin covers a typical soybean processing plant layout with detailed description of the various pieces of equipment needed for the process. It discusses equipment for extracting oil from soybeans by the expeller method, as well as other equipment applicable to milling and to processing operations.

Heat-transfer Equipment—The Downingtown Iron Works, Downingtown, Pa., has issued a 24-page catalog dealing with heat exchangers of various types. The booklet is profusely illustrated with photographs and sketches, and it gives considerable detailed engineering data concerning the design and performance of heat exchangers.

High-vacuum Pumps — Describing seven standard sizes of high vacuum pumps ranging from 15 to 750 cu. ft. per min. is a 12-page catalog, No. 80, issued by Beach-Russ Co., 50 Church St., New York 7. The catalog gives considerable information concerning the design, construction and performance of these high-vacuum pumps. Both dry vacuum and wet vacuum pumps are covered.

Mixers—Bulletin No. 62, describing a fairly complete line of Abbe-Lenart mixers, has just been issued by the Abbe Engineering Co., 50 Church St., New York 7. The bulletin is well illustrated and it gives considerable engineering information about these mixers. It also contains an offer of free laboratory service to those who send samples of special materials to be tested.

Air Conditioning—How to plan air conditioning to control temperature and humidity, clean the air and provide adequate ventilation and circulation is discussed in a new 16-page illustrated booklet announced by Westinghouse Elevator Co., 150 Pacific Ave., Jersey City 4, N. J. The booklet outlines the principal factors that must be considered in planning air conditioning for particular applications.

Reconditioned Machinery—Bulletin 441 has just been issued by Morse Bros. Machinery Co., 2900 Broadway, Denver 1, Colo. It is a 36-page, well-illustrated booklet. It covers a wide range of equipment including tanks, mills, blowers, motors, pumps and many other items. In addition to photographs of the various pieces of equipment available, considerable detailed engineering information is included.

Reduction Unit—A concise description of the new Speedaire fan-cooled worm-gear reduction units made by Cleveland Worm & Gear Co., Cleveland, is contained in a 4-page bulletin. A large illustration shows how the high-velocity air stream is held on a directed course by the double-wall housing and how the heat-dissipating surface is nearly doubled by integrally cast fins on the outer wall of the housing.

Diesel Engines—To illustrate the applications of its diesel engines, the Caterpillar Tractor Co., Peoria, Ill., has issued a two-color, 32-page booklet. The booklet is well illustrated with photographs of actual installations.

PLANT SUPPLIES

Labeling Handbook—National Adhesives, 270 Madison Ave., New York 16, has announced that they are still supplying free, upon request, copies of its 32-page handbook, "Successful Bottle Labeling." This booklet contains valuable information on labeling. It describes many of the common practices that produce poor labeling results, and suggests solutions to labeling difficulties. Also given are labeling methods, label specifications, hints on handling adhesives and recommendations for the care of labeling equipment. A copy of this booklet ought to be in every labeling room.

Facts About Salt—Now available is a well-illustrated 24-page fact book, "The Story of Diamond Crystal Salt." Two regular refining methods are described, and the Alberger process is explained in some detail. Other features include an explanation of how telescoping pipes are used in pumping salt from the earth and a list of the specialized industrial uses of salt.

The book may be secured from Diamond Crystal Salt Co., Inc., St. Clair, Mich.

Regenerating Zeolites—Reprint No. 32 summarizes extensive research work done on the use of sulphuric acid as the regenerant in water conditioning employing carbonaceous zeolites. It describes some of the important theoretical considerations and shows the characteristics of various salts singly and in combination. Water conditioning for industrial use or for boiler feed purposes may be treated by this method. Copies of this reprint may be obtained from Cochrane Corp., 17th and Allegheny Ave., Philadelphia, 32.

MATERIALS HANDLING

Tractors and Trucks—Valuable information on materials handling problems is contained in the new catalog No. 7-11 issued by Mercury Manufacturing Co., 4030 S. Halsted St., Chicago 9, Ill. Attractively designed, printed in four colors and held in a ring-type binder, the catalog contains 40 pages and gives a fairly complete description of, and engineering specifications for, Mercury tractors and trailers, platform trucks and fork life trucks. Reproductions of WPB regulations that govern the purchases of industrial trucks and tractors, as well as reproductions of the actual forms to be filed with WPB in purchasing, are included.

Hydraulic Lift Truck—A 4-page bulletin, No. 136, has been issued by Lyon-Raymond Corp., 1683 Madison St., Greene, N. Y. It describes high-lift hydraulic trucks made of tubular steel, electric welded, elevating from 6 in. to 48 in. by hand pump. Lowering is controlled by finger-flip relief valve.

Trucks and Trailers—Fully illustrating and describing an extensive line of warehouse trucks, trailers, dollies, platform skids, lift jacks, wheels and axles is a 56-page catalog issued by Howe Scale Co., Rutland, Vt. The catalog, printed in two colors gives complete specifications for each product, illustrates many special as well as standard items, and is indexed alphabetically by content and by code numbers for ready reference.

MISCELLANEOUS

Thermocouple Data Book—An enlarged edition of its Thermocouple Data Book has been issued by the Wheelco Instruments Co., Harrison and Peoria St., Chicago 7. Designated Bulletin S2-5 and containing 40 pages, the catalog describes products, gives prices and offers recommendations for thermocouple users. Also included are various interesting tables on thermocouples, temperature conversion, wire resistance, and so forth.

Rubber Products—B. F. Goodrich Co., Akron, Ohio, has just issued a general booklet on its industrial rubber products. Included in the booklet are descriptions of the company's line of Vibro-insulators—devices of rubber and metal which reduce vibration—molded, extruded and sponge rubber products, rubber-lined tanks and valves, V-belts and cements.

THE sweet potato is rapidly becoming a major crop in Alabama. In these three fields, real opportunities are offered to processors:

1. ***Plans to wash, grade, wax and pack edible sweet potatoes for fast growing markets.***

The sweet potato is a natural crop for Alabama. Several sections, comprising large areas, are now producing a yield and quality of sweet potato equal to any in America and surpassing most. Alabama sweet potatoes brought highest prices last year on one of the largest fresh markets in the country. Good truck and rail facilities afford quick access to consuming markets.

2. ***Processing plants to manufacture stock feed in this rapidly expanding live-stock section.***

Live-stock production in Alabama and other Southern states is increasing by leaps and bounds. The dehydrated sweet potato has proven to be as good as shelled corn as a feed for most classes of live-stock, and will give, with equal treatment, three times the feed per acre as corn.

3. ***Plants to manufacture a variety of newly developed and fully prepared food products.***

The Alabama Agricultural Experiment Station has developed a series of new, different and delicious food products from the sweet potato. These include a number of breakfast foods and cereals—the first to be adequately sweetened by their own sugars and only prepared breakfast food carrying high Vitamin A naturally. Other products include semi-sweet confections, taffies, etc., and fully prepared flour most satisfactory for baking and flavoring.

For detailed data on opportunities for sweet potato processing plants in Alabama, white Dept. F, Alabama State Chamber of Commerce. Montgomery 1, Ala.

ALABAMA
STATE PLANNING BOARD
Montgomery 5, Alabama

BOOKS

Future Markets

PLAN YOUR POSTWAR MARKETS. Published by McGraw-Hill Publishing Co., 330 West 42nd St., New York 18, N. Y., 1944. 32 pages, 8½x11 in.; paper. Free.

Fortunately for the record, the war has created no shortage of digits with which to indicate American production. And in production, the food industries of this country have a place in the very top drawer. As a result, it will not be production, but markets, that will require the food manufacturer's attention in the postwar period.

This booklet is being distributed in the hope that it will prove a provocative guide to stimulating action in the field of industrial marketing. It offers a method and provides a program for checking prewar, present and prospective customers as a means of obtaining the variable factor in any specific market analysis. The booklet also covers the various phases of advertising and the problems of direct sales, as well as a salesmen training program, all of which should be of value in the highly competitive food field.

Air Conditioning

AIR CONSERVATION ENGINEERING. Edited by G. S. Dauphinee, F. H. Munkelt and H. Sleik. Published by W. B. O'Connor Engineering Corp., 114 E. 32nd St., New York, N. Y., 1944. 111 pages; 8½ x 11 in.; paper. Price, $2.

The stated purpose of this book is to make available to the engineering profession the experience and useful data on air conditioning that has been accumulated and correlated by the publishers. It will help both the engineer and the nontechnical business operator to determine the two basic factors upon which airconditioning is dependent—the cost of installation and the cost of operation. The book also outlines the theory and practice of air conservation and should be of particular interest to the food plant engineer.

Protein Review

ADVANCES IN PROTEIN CHEMISTRY, Volume I, Edited by M. L. Anson and John T. Edsall. Published by Academic Press, Inc., 125 E. 23rd St., New York, September, 1944. 341 pages; 6¼x9¼ in.; cloth. Price, $5.80.

In this first volume of a planned series of reviews on the advances being made in protein chemistry, special emphasis is placed on proteins as they occur in nature, as components of complex biological systems.

The contributions are all by U. S. scientists who were required to prepare their papers under difficult wartime conditions. Despite many handicaps, the editors have brought out a book that should find a ready welcome in this rapidly spreading branch of chemistry.

Research Review

VITAMINS AND HORMONES, Vol. II. Edited by Robert S. Harris and Kenneth V. Thimann. Published by Academic Press, Inc., 125 E. 23rd St., New York 10, N. Y., 1944. 514 pages; 6¼x9¼ in.; cloth. Price, $6.80.

Recent advances in research and applications in the vital vitamin and hormone field are offered to the food chemist in this review. If there was any doubt of the need for bringing together this widely scattered literature, it was dispelled, in the opinion of the editors, by the success of the first volume.

The review represents the work of 16 authors. Their aim has been to present a balanced picture of the development and current status of each subject. The subjects themselves range through physics and chemistry to pathology and clinical medicine.

Government Publications

Impact of the War on the Financial Structure of Agriculture. Bureau of Agricultural Economics. Unnumbered mimeographed report. Available from the Bureau without charge.

This is an economic review of the sources of food raw materials and the influence of farm conditions on present supply and the prospect for postwar.

Wartime Packaging of Agricultural Products. Unnumbered mimeographed report available without charge from Office of Materials and Facilities, War Food Administration, Washington 25, D. C.

Here is given in this report a statistical statement of the amount and character of packaging materials used for foods and beverages under wartime controls. It covers a market estimated at $2 billion in 1944.

Fish and Shellfish of the South Atlantic and Gulf Coasts. Department of Interior. Conservation Bulletin 37. Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. Price 10 cents.

The types and values of food supplies from the sea in the areas named are here described.

PATENTS

Cream of High Butterfat Content Made From Medium-fat-content Cream by Preheating, Pasteurizing with Live Steam, Cooling and Centrifuging. Cream Recovered Is Forced Through Cooling Element in Spiral Path to Form Thin Continuous Strip and Is Discharged in Plastic State—William T. Crighton, to Producers Creamery Co., Springfield, Mo. No. 2,358,214. Sept. 12, 1944.

Cereal Grains Enriched in Nutrients Preparatory to Milling Into Flour—Francis Heron Rogers, Elmhurst, Kenley, and Erich Gustav Hunzenlaub, Brentford, England. No. 2,358,250. Sept. 12, 1944.

Rice and Similar Cereals Precooked by Steeping in Hot Water to Partially Gelatinize Starch Content and Subsequently Vacuum Dried—Erich Gustav Huzenlaub, Brentford, and John Heron Rogers, Elmhurst, Kenley, England. No. 2,358,251. Sept. 12, 1944.

Whole Fruit Colored Without Affecting Oil Cells or Causing Decay—David G. Ulrey, Lakeland, Fla., to Gregg Maxcy, Sebring, Fla. No. 2,358,266. Sept. 12, 1944.

Dried Egg Treated With Unesterified Polyhydric Alcohol, an Aliphatic Monocarboxylic Acid, and Proteolytic Enzyme to Give Product Containing Intra-albumen Content—Charles N. Frey, Scarsdale, and Glennard E. Miller, Bronx, N. Y., to Standard Brands, Inc., New York, N. Y. No. 2,358,324. Sept. 19, 1944.

Sugared Milk Concentrated to Approximately 90 Percent Solids Preparatory to Drying in Stream of Turbulent Atmosphere to Sugared Milk Powder—Joseph E. Rosecky, Menomonee Falls, Wis., to Gehl Guernsey Farms, Inc., Milwaukee, Wis. No. 2,358,418. Sept. 19, 1944.

Pectase Recovered From Natural Pulpy Plant Juice—John J. Willaman, Plymouth Meeting, and Claude H. Hillas, Philadelphia, Pa., to Secretary of Agriculture, U. S. A. No. 2,358,429. Sept. 19, 1944.

Pectin in Solution Treated With Pectase to Give Highly Polymerized Pectinic Acid of Predetermined Methoxy Content—John J. Willaman, Plymouth Meeting, Hugh H. Mottern and Claude H. Hills, Philadelphia, Pa., and George L. Baker, Newark, Del., to Secretary of Agriculture, U. S. A. No. 2,358,430. Sept. 19, 1944.

Cheese Loaves Made From Hard Cheese Portions by Treatment With Live Steam to Soften Rind Before Bringing Opposed Surfaces Together Under Pressure—Clyde L. Mitchel and Paul Stocklin, to Challenge Cream & Butter Association, Los Angeles, Calif. No. 2,358,526. Sept. 19, 1944.

Soup Stock Packaged, Shipped and Stored in Gelatin Shell Which Upon Cooking Becomes Constituent of Prepared Soup—Robert P. Scherer, to Gelatin Products Corp., Detroit, Mich. No. 2,358,598. Sept. 19, 1944.

Wheat Wet Milled to Produce Flour Rich in Vitamins and Soluble Minerals—Victor Rakowsky and Janis R. Reid, Joplin, Mo. No. 2,358,827. Sept. 26, 1944.

Livers Macerated With Water, Extracted With Immiscible Solvent, Freed From Heat-coagulable Solids and Spray Dried to Powder Form—Siegfried Maurer and Harold Oliver Wiles, Chicago, Ill. No. 2,358,869. Sept. 26, 1944.

Livers Macerated With Water, Filtered For Removal of Solids, Spray Dried and Extracted With Ethylene Dichloride—Siegfried Maurer and Harold Oliver Wiles, Chicago, Ill. No. 2,358,870. Sept. 26, 1944.

Vanilla Beans Extracted in 20 Percent Alcohol Solution at Greater Than 213 Deg. F. and Under Greater Than Atmospheric Pressure—Louis V. Towt, Los Angeles, Calif., to C. V. Goffinet and Ruth Goffinet, San Gabriel, Calif. No. 2,358,947. Sept. 26, 1944.

Eggs Conveyed, Candled and Broken in Straight-line Production Manner, Using Screw Conveyor To Dispose of Shells—Edward S. Schneider, Chicago, Ill. No. 2,359,006. Sept. 26, 1944.

Foods Dehydrated During Passage Through Enclosed Compartment on Continuous Conveyor Belt Passing Below and Over Banks of Heating Elements—Henry J. Burnett, West Brookfield, Mass. No. 2,359,199. Sept. 26, 1944.

Zein Solutions Prepared Directly From Corn Gluten—Roy E. Coleman, Chicago, Ill., to Time, Inc. Nos. 2,359,202; 2,359,203; and 2,359,204. Sept. 26, 1944.

Cream Filled by Substantially Anhydrous Emulsion Consisting of Soft Edible Fat and Dried Starch Conversion Sirup Solids—Robert L. Lloyd, Laurelton, and Paul H. Prentiss, Kenmore, N. Y., to American Maize-Products Co. No. 2,359,228. Sept. 26, 1944.

Ground Malted Cereal Suspension Inoculated With Bacillus Mesentericus Group Bacteria and Incubated Under Aerobic Conditions Preparatory to Inoculating With Spores of Mold Capable of Increasing Diastase Content of Cereal—Leo M. Christensen, Miller, Neb., to National Agrol Co., Inc., New York, N. Y. No. 2,359,356. Oct. 3, 1944.

Starch Dextrinized by Treatment With Gas in Presence of Mineral Acid Catalyst—Steward G. Morris, Philadelphia, Pa., to Secretary of Agriculture, U. S. A. No. 2,359,378. Oct. 3, 1944.

Cherries Sorted Into Pitted and Unpitted Portions by Automatic Mechanical Means—Giovanni Frova, Jackson Heights, N. Y. No. 2,359,414. Oct. 3, 1944.

Yeast Cultured to Have High Vitamin B_1 Content—Horace E. Harrison, East Brunswick Township, Middlesex, N. J., to Anheuser-Busch, Inc., St. Louis, Mo. No. 2,359,521. Oct. 3, 1944.

Starch Converted to Dextrose by Continuous Process—Anthony C. Horesi, Downers Grove, Ill., to Corn Products Refining Co., New York, N. Y. No. 2,359,763. Oct. 10, 1944.

Beer Wort Aerated and Cooled for Removal of Precipitated Solids During Counter Flow Against Current of Cooled Air—Frank H. Schwaiger, Grantwood Village, Mo., to Anheuser-Busch, Inc., St. Louis, Mo. No. 2,359,876. Oct. 10, 1944.

Frankfurters Mechanically Cored—William F. Serr, to Yankfrank, Inc., New York, N. Y. No. 2,359,881. Oct. 10, 1944.

Sugar Juice Treated With Hydrogen Exchange Agent at Temperature Not Conducive to Acid-inversion, Preparatory to Activated Carbon Purification and Decolorization, Followed by Neutralization of Excess Acidity by Addition of Juice With Alkaline Reaction—Henry W. Dahlberg, to Great Western Sugar Co., Denver, Colo. No. 2,359,902. Oct. 10, 1944.

Tartrates Removed From Fruit Pomace in Continuous Manner—Ernest Kurt Metzner, Cloverdale, Calif., to Stauffer Chemical Co. No. 2,359,929. Oct. 10, 1944.

Edible Nuts Scored Mechanically to Simplify Cracking and Recovery of Nut Meats—Dee W. Tackett, Fort Worth, Tex. No. 2,359,947. Oct. 10, 1944.

Skim Milk Subjected to Pressure Greater Than Atmospheric, Heat Treated, Cooled, and Treated With Sodium Alkali to Obtain pH Between 9 and 11.5—Lewis A. Baumann, Chevy Chase, Md., to Anthony R. Sanna, Filip Leon Sanna and Bartell J. Sanna, Madison, Wis. No. 2,360,033. Oct 10, 1944.

Vitamin Content of Fish Oils, Fish Liver Oils and Concentrates Transferred to Dry Milk Solids in Presence of Solvents, Followed by Separation of Dry Milk Solids From the Solvent Solution and Recovery of Solvent—Loran O. Buxton, Belleville, N. J., to National Oil Products Co., Harrison, N. J. No. 2,360,039. Oct. 10, 1944.

Zein Dispersion Consisting of 10 Parts of Zein, 30 Parts of Ethyl Alcohol (90 Percent by Volume), 10 Parts of Sulphated Stearyl Alcohol, and 100 Parts of Water—Charles Waldo Stewart, River Forest, Ill., to Corn Products Refining Co., New York, N. Y. No. 2,360,061. Oct. 10, 1944.

Olives Pitted Mechanically—Cecil A. Britton, to Food Machinery Corp., San Jose, Calif. No. 2,360,103. Oct. 10, 1944.

The Bad Boys Are on the Spot

IN DEMOCRATIC countries, police departments nab "bad actors" and keep them out of circulation. In food processing, we also encounter "bad actors"—elements and conditions that rob products of freshness, turn them rancid, destroy their flavor. But food technologists are already on their trail. They know, for example, that they must protect food products from irradiation by light . . . exclude oxygen or excessive humidity . . . guard against insect infestation.

Recent research shows that copper and iron, even in minute traces, are "bad actors." In the manufacture of shortening, they are eliminated to increase rancidity resistance of fats and oils. They affect stability of dairy, bakery, and meat products—and practically any food that contains the slightest traces of fats or volatile flavors easily oxidized.

Yes, they even affect the stability of certain vitamins—Vitamin "C," for example, and some of the "B" group.

We have reduced the copper and iron in Diamond Crystal Salt until today they represent less than 1 part per million. Salt products in general, however, may contain significant amounts of both copper and iron.

NEED HELP? HERE IT IS!

Why not check up on the salt you are now using? And if you would like our help in keeping the "bad actors," copper and iron, down to a minimum in your plant, drop a note to our Director of Technical Service, Diamond Crystal, Dept. J-5, St. Clair, Michigan.

DIAMOND CRYSTAL
ALBERGER PROCESS SALT

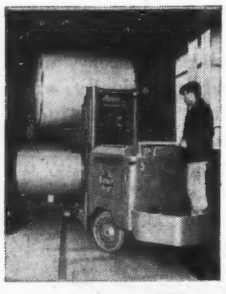
IS YOUR PROBLEM ONE OF EFFICIENT WAREHOUSING?

Since handling of material is the principal operation in warehousing, the proper selection of handling equipment is of prime importance. Baker Trucks make four distinct contributions to warehousing efficiency: 1. They increase storage space by tiering. 2. They cut handling costs. 3. They speed movement of materials. 4. They do the work of 8 to 10 men.

★ ★ ★

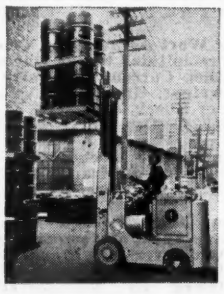
A leading industrial engineer was given the job of designing a large model warehouse for the world's largest paint manufacturer. Baker Trucks and Tractors were specified to bring about top efficiency in sorting, storing and shipping the more than 100,000 items handled in this warehouse. Fork Truck illustrated at left is stacking drums on pallets three high.

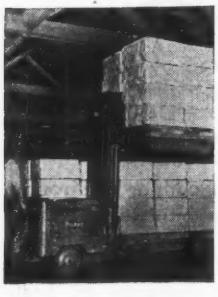
A Baker Material Handling Engineer was called in to make a survey for a large food warehouse. Upon his recommendation a Baker Fork Truck plus a conveyor system was installed. Operating costs were reduced from $6.68 to $4.98 per ton—a saving of 25.4%. Gross savings amounted to $153.00 per week or $7,956.00 per year. (See illustration at right.)



Carloading and unloading is an important warehouse function. The Baker Hy-Lift Truck with telescoping uprights, (see illustration at left) enters a box car door with ease and tiers material inside the car, conserving shipping space. Savings in loading operations are reported as high as 75% over former methods.

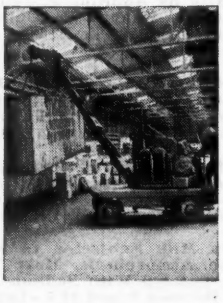
A large chemical manufacturer supplements his inside storage with yard storage of large drums. The Baker Fork Truck (right) is stacking the fourth and fifth tier of drums to conserve space. The same truck is also used to tier pallet loads of bulk materials in sacks inside the warehouse, and for loading products in box cars or highway trucks.





A printer and publisher faced with the need for doubling his storage space avoided additional warehouse rent by installing a Baker Hy-Lift Truck Tiering skid-loads of paper stock, books and magazines multiplied the effectiveness of available space and on rental savings alone paid for his truck in 18 months. (Left)

A large stevedoring company uses Baker Crane Trucks to move crated machinery, motor cars, newsprint rolls, paper pulp and other manufactured products in warehouse and on or off shipboards in the quickest possible time and at the lowest cost. This company has reduced handling costs 18% to 20% through the use of Baker Trucks. (Right)



WRITE FOR YOUR COPY

Plant and production managers, traffic managers, superintendents, purchasing agents and any others concerned with material handling will find the new Baker Catalog No. 52 a valuable reference.

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Company
2146 WEST 25th STREET • CLEVELAND, OHIO
In Canada: Railway and Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

Solid Coffee Concentrate Made to Consist of Porous Dehydrated Mixture of Soluble Coffee Solids, Volatile Condensable Constituents, Volatile Relatively Noncondensable Constituents and Corn Sirup—Wilbert A. Heyman, to Granular Foods, Inc., New York, N. Y. No. 2,360,342. Oct. 17, 1944.

Sausage Casings Washed, Graded and Treated With Preservative Composition Consisting of Glycerine and Sodium Chloride, Each in 25 to 30 Percent Water Solution, Preparatory to Packaging in Suitable Containers and Storing at Normal Temperatures Until Used—Daniel Topjian, Watertown, Mass. No. 2,360,374. Oct. 17, 1944.

Zein Extracted From Corn Gluten With Alcohol and Treated With Oxidizing Agent to Obtain Solution of Two Liquid Phases—James F. Walsh, Yonkers, N. Y., Siegfriend M. Kinzinger, Hammond, Ind., and Willard L. Morgan, Edgewood, R. I., to Prolamine Products, Inc., Dover, Del. No. 2,360,381. Oct. 17, 1944.

Olives Destemmed and Pitted by Automatic Mechanical Means—Giovanni Frova, New York, N. Y. Nos. 2,360,411 and 2,360,412. Oct. 17, 1944.

Blue-veined Cheese Made From Milk Heated by Sudden Action of 165 to 175 Deg. F. Steam Under Vacuum Followed by Quick Cooling to Avoid Destruction of Milk Lipases—Nels E. Fabricius and Verner H. Nielsen, Ames, Iowa, to Iowa State College Research Foundation. No. 2,360,556. Oct. 17, 1944.

Frozen Confection Coating Made to Consist of 4 to 16 Percent by Weight of Sugar, 6 to 18 Percent by Weight of Milk Solids, and Water to Give Small Discrete Ice Particles Upon Application to Confection—Daniel Glazer, Chicago, Ill. No. 2,360,559. Oct. 17, 1944.

Liquid Food Containers Mechanically Filled to Predetermined Levels—Charles E. Kerr, Hoopeston, Ill., to Food Machinery Corp., San Jose, Calif. No. 2,360,565. Oct. 17, 1944.

Direct Consumption Sugar Made Through Use of Continuous Closed Clarifier— Harry M. Row, Rosedale, La. No. 2,360,586. Oct. 17, 1944.

Meat Slitted Mechanically by Use of Relatively Thin and Flat Meat Slitting and Knifing Disks—Joseph P. Spang, Quincy, Mass., to Cube Steak Machine Co., Boston, Mass. Nos. 2,360,728 and 2,360,729. Oct. 17, 1944.

Coffee Roasted at Predetermined Temperature Under Automatic Control—Raphael Atti, Cliffside Park, N. J. No. 2,360,838. Oct. 24, 1944.

Food in Plurality of Elongated Perforated Containers Dehydrated While Passing Through Steam Heated Chamber—Danial Brewer, Longview, Tex., one-half to Edward Fanning Wheat, Kilgore, Tex. No. 2,360,930. Oct. 24, 1944.

Grape Juice Separated From Solids During Passage of Grapes Through Crushing Rolls Onto Shaker Table With Perforated Bottom—Laurence Moroni, Lodi, Calif. No. 2,360,964. Oct. 24, 1944.

Canadian Patents

Fresh Meat Aged in Ventilated Refrigerated Storage Area Maintained at Humidity of About 80 to 85 Percent at Temperature of About 29 to 35 Deg. F.—Beverly E. Williams, to Industrial Patents Corp., Chicago, Ill. No. 423,022. Oct. 3, 1944.

Pie Crusts Sheeted in Continuous Manner by Mechanical Means—Lloyd J. Harriss, Kenilworth, and Bernard Lambers, Oak Park, Ill. No. 423,057. Oct. 3, 1944.

Margarine Made to Consist of Hardened Fats Churned With Water and Milk to Form Soft Plastic Mass to Which Fats of Lower Melting Point Are Subsequently Added in Two Steps With Continued Mechanical Treatment To Obtain Desired Consistency—John Edward Green, to Co-Operative Wholesale Society, Ltd., Manchester, County of Lancaster, England. No. 423,114. Oct. 10, 1944.

Fish Livers Protectively Packed in Concentrated Ammonium Hydroxide Solution Containing Ammonium Buffer Salts for Prolonged Storage Or Shipment Preliminary to Recovering of Oil Content—Herbert Hempel, Essex, Mass., to Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass. No. 423,414. Oct. 24, 1944.

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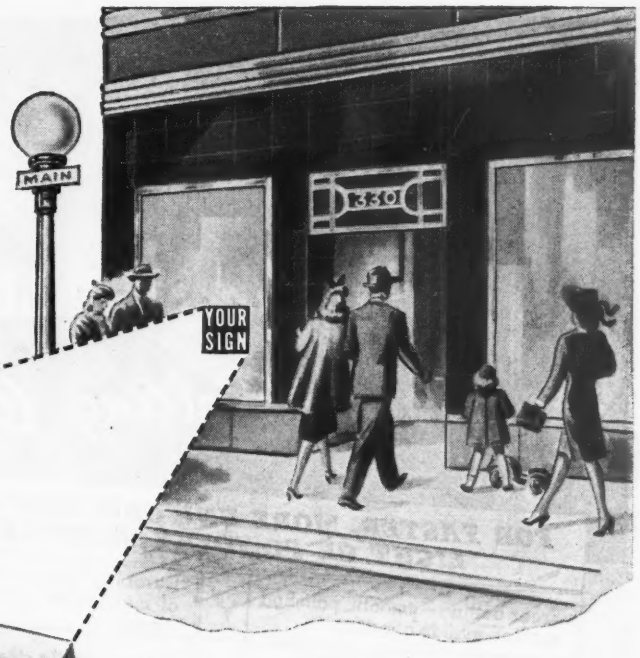

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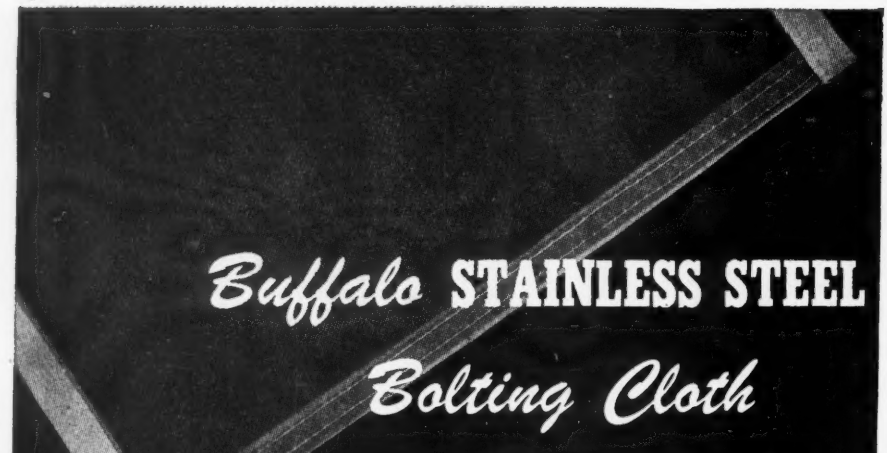

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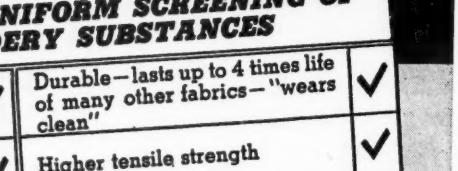

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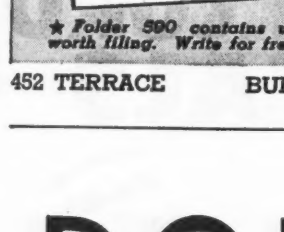

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Foods from Yams

(*Continued from page 75*)

Production on a commercial scale was started several weeks ago at Auburn in the Station's recently built experimental pilot plant. In recent months inquiries regarding manufacturing rights have been received from 12 states, and from Mexico, Cuba, and South America. Over 25 companies in this country have expressed interest in the manufacture of one or more of the products.

Patents have been applied for in the name of the inventors and are assigned to the Alabama Polytechnic Institute. If granted, manufacturers will be licensed to make Alayam products, and returns from the royalties are to go to further research. A nonprofit research foundation is to be established for administering the patents when granted.

It is the opinion of those who have tested the products and those who are considering their manufacture that Alayam products will be a staple food on the market after the war.

Beet Blanching

(*Continued from page 86*)

the beet was taken for the benzidine test, slight positive coloration being observed at the center and in the adjacent zone. The beet was cooked so completely that the flesh was soft and very difficult to handle. So the combination of precooking and retorting would scarcely be practicable.

In the next experiment the preliminary treatment was as above, and the center temperature after precook was 137 deg. F. But the precooked beet was peeled, cut into approximately ⅜-in. cubes and placed in a layer 2 in. deep in a wire tray. One thermocouple lead was inserted into the center of a cube in the middle of the layer and the time measured after the center temperature reached 190 deg. In this case the retort temperature was 212 deg. F. (atmospheric pressure). The center temperature of the beet layer reached 212 deg. F. 5 minutes after reaching 190 deg. F. Blanching at 212 deg. F. was continued for 15 minutes more, so that the total time during which the product was at 190 deg. or above, was 20 minutes. This treatment resulted in a positive benzidine test.

Next, the precooked whole beet was retorted at 240 deg. F., and

the beet reached the temperatures listed in Table III. Then the retorted whole beet was diced and trayed and steam blanched for 6 minutes, the temperature of the diced beets being those given in Table IV. Here, the benzidine test was negative.

When the precooked whole beet was diced, trayed and retorted at 240 deg. F. for 10 minutes, it reached 240 deg. in 2 minutes and the benzidine test was positive. With the same procedure except that retorting was followed by a 6-minute steam blanch, the benzidine test showed a slight positive coloration.

Beets, diced and boiled in water for 30 minutes, although badly leached, gave a strongly positive benzidine test.

Reactions of benzidine and H_2O_2 (in the concentrations used in conducting the test for adequacy of blanching) with pure solutions of bivalent copper ion indicate that 1 p.p.m. of this ion may induce a false positive benzidine reaction. A concentration, in pure solution, of 10 p.p.m. of ferric iron is apparently necessary to produce a color reaction of possible interfering intensity.

References

1. W. V. Cruess, "Commercial Fruit and Vegetable Products," McGraw-Hill Book Co., Inc., New York, p. 504, 1938.
2. E. H. Wiegand, H. S. Madsen, and F. E. Price, "Commercial Dehydration of Fruits and Vegetables," Oregon Agricultural Experiment Station Bulletin No. 417, pp. 17-19, 1943.
3. Rodney Beecher Harvey, "Plant Physiological Chemistry," The Century Co., London, pp. 71, 72 and 76. 1930.
4. "Tests for Indicating Amounts of Blanching," Information Sheet of U. S. Department of Agriculture, Agricultural Research Administration, Bureau of Agricultural and Industrial Chemistry, Western Regional Research Laboratory, 1943 (mimeograph).
5. H. Ucko, "The Peroxidase Nature of 'Active' Iron." Klin, Wochschr. vol. 7, pp. 1515-1517, 1928; from Chemical Abstracts, vol. 22, p. 4542, 1928.

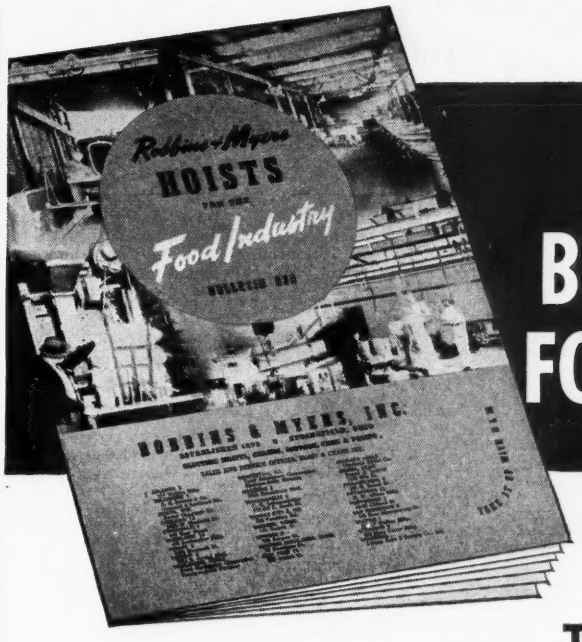
Lye Peeling Pays Off

(*Continued from page 74*)

moval of the peel but prevents oxidation by enzymic action during the trimming operation. The depth of the precook must be at least 3/8 in. The cooking in the lye peeler adds about 1/16 in. and the washing which follows removes the disintegrated tissue. The washing operation removes about 1/16 in. of potato, or an amount equal to the depth of penetration of the lye solution.

The observation has been made that the precook is just sufficient to inactivate the peroxidase enzyme under the epidermis (Fig. 2).

The depth of material inactivated to the peroxidase test on a peeled



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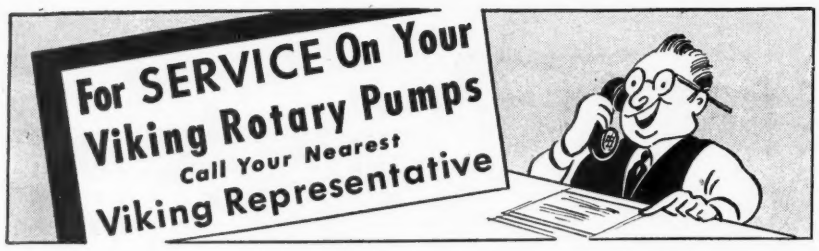

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potato is therefore very shallow. The potato in this condition can be held for some time, should it be necessary to shut down for repairs. Loss is avoided from oxidation, which causes a condition sometimes known as "measles" or "reddening." This reddening is perhaps caused by the oxidation of the tyrosine by tyrosanase enzyme.* "Graying ends" is also avoided by the precooking.

The lye peeler is of the draper type (Fig. 3), and is heated by a steam chest under a portion of the peeler and a heat exchanger as used as an auxiliary. It has been found that dilution by live steam jets is to be avoided, as this demands an excessive amount of caustic soda to maintain the concentration at the desired level. In the present operation, the lye concentration is held at about 14 percent, with the temperature of the solution as near the boiling point as possible. The concentration is manually controlled at present. The check by the peeler operator on the concentration is made by titration with 2.5 normal acid.

The peeler is charged with lye as follows: A 700-lb. barrel of solid caustic is dissolved in a separate tank (Fig. 4) with live steam and water. As the peeling operation demands additional caustic, this solution is added from the tank.

The peeler in the Simplot plant has a capacity of approximately 15 tons of potatoes per hour. There is about 1,000 gal. of solution in the peeler, and the solution is circulated through an over-under baffle tank and the heat exchanger by a 75-g.p.m. pump. The potatoes are in the caustic solution for an average of two minutes. Following the peeler are two Muir barrel-washers and two Paramount master brush washers operating with water at 80-lb. pressure (Fig. 5).

Auxiliary pressure equipment is available to make possible the use of water at as high as 300-lb. pressure, but this is not employed unless the water pressure drops considerably below the desired working pressure.

Cost Is Low

The cost of the caustic for peeling by the lye method at Simplot is about 3 cents per 100 lb. of raw potatoes processed. This is considerably less than the cost reported for most operations and is not due to the difference in the cost of the

*Private communication from Dr. W. V. Cruess, June, 1943.

caustic used. The difference in the cost per pound of caustic (solid vs. flake) would not appreciably affect the cost per 100 lb. of potatoes processed.

Facts About Packaging

(*Continued from page 96*)

at 98 deg. F. and 93 percent relative humidity.

2. *Effect of Storage Time and Temperature*—As in the case of almost all the dehydrated vegetables studied, dehydrated potatoes deteriorated considerably when stored at elevated temperatures. The rates of deterioration increased rapidly with the storage temperature. For example, the potatoes were still passable in flavor after one year at ordinary room temperatures (75 to 80 deg. F.), but after six months at 98 deg. F. they were considerably darkened and were inedible. At 130 deg. F., the deterioration was so rapid that they were almost black and definitely inedible in only one month. Over 50 percent of the initial thiamine content was retained after 12 months of storage at 75 to 80 deg. F., while in the potatoes stored at 98 deg. F., the thiamine content dropped below 40 percent in six months. When stored at 130 deg. F., the thiamine content fell to 25 percent of the original value in three months. Further examinations of the sample stored at 130 deg. F. were discontinued after three months because of the extent of the deterioration.

The retention of riboflavin, on the other hand, was unaffected by the storage temperature or time.

The data on ascorbic acid content show little difference in retention due to storage temperature but do indicate less retention as the storage period increased. For example, at room temperature, approximately 15 percent of the original ascorbic acid was retained after 12 months.

The drained-weight data indicate a tendency for the potatoes stored at elevated temperatures to lose their ability to reconstitute, although the drained-weight figures went up again at 98 deg. F. and 12 months of storage. At that time, however, the potatoes were no longer edible. These conclusions are reached on examining the potatoes while they still were in edible condition. Also, increased "lumpiness" in the mashed potatoes at the later examinations was evidence of loss of ability to reconstitute.

Some CO_2 was evolved by the product stored at 130 deg. F. and a small amount by that at 98 deg. F.

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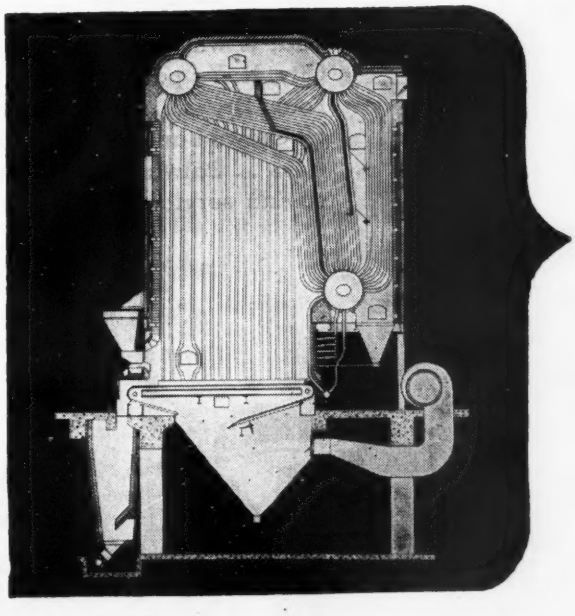

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FREEZING

Blanched Blueberries

Loss of flavor and development of woody texture in frozen blueberries can be corrected by blanching. Steam-blanched berries packed in dry sugar at a 5 to 1 ratio are reported to have excellent aroma and flavor, with a good degree of firmness and no toughness in the skins. Similar berries packed in dry sugar or in saturated sirup before freezing had a good appearance but inferior flavor and aroma, with a tough woody structure. While in every case sugar packing before freezing gave better flavor than products packed without it, citric acid did not improve flavor, color or texture of frozen berries that had not been blanched.

Passing the berries through a steam chamber on shallow trays of wire screening, so that live steam could reach them from both top and bottom, gave good results. One minute was generally sufficient, but the time of blanching can be increased to 2 or 3 minutes for tough berries. The development of the woody texture is attributed to an enzyme which can be inactivated by heat. Small lots of berries immersed in boiling 75 percent sugar sirup for 15 to 20 seconds, then drained for one minute, were excellent both in flavor and texture after freezing and storage.

Digest from "Blueberries for Freezing Improved by Blanching," by J. G. Woodroof and I. S. Atkinson, Refrigerating Engineering, vol. 48, 275-8, 314, October, 1944.

DAIRY PRODUCTS

Cheese Sediment

SEDIMENT TESTS will detect cheese made from unclean milk or cream, except where the milk has been sufficiently filtered or clarified in the factory. However, the usual milk sediment disk does have a hiding effect which may give entirely erroneous results on samples of cheese made from unfiltered milk.

Careful microscopic counts on sediment collected from both citrate and phosphoric acid treated samples of Cheddar cheese showed that it is necessary to use a closely woven poplin cloth or other relatively smooth surface over the filter disk to retain the particles in a visible position. When so held, the phosphoric treated filtrate gives somewhat higher sediment counts than the citrate, but the authors conclude that there is not much to choose between the solvents.

Neither solvent, under the conditions used in making these tests, destroys enough of the sediment material to prevent identification of its source, but both do attack it.

There is irregularity in the distribution of sediment from one cheese to another in the same batch, although distribution within any one cheese seems uniform. As many cheeses as possible should be tested, but samples from the top of each cheese are sufficiently representative.

Macroscopic grading of filter disks is sufficient for ordinary plant control purposes. Microscopic examination of the test pads is necessary for identification of the source of contaminating material.

Digest from "Testing for Extraneous Matter in Cheese," by R. Miersch and W. V. Price, Journal of Dairy Science, vol. 27, 881-95, October, 1944.

Control Tests

LACTIC ACID determinations are relied on by Federal regulatory officials to judge the quality of concentrated and dried milk. The colorimetric technic (Hillig) is being used.

This method embraces the steps of preparation of a milk serum with sulphuric and phosphotungstic acids, extraction with very pure ethyl ether, neutralization with barium hydroxide and removal of alcohol-insoluble barium salts, treatment of the filtrate with carbon and hydrochloric acid and photometric measurement of the yellow color produced by a ferric chloride addition.

It has a disadvantage in the time required (8 hours). Also a photoelectric colorimeter is essential for highly accurate results. But the method is capable of a high degree of accuracy, as shown by tests in which the recovery of added lactic acid averaged 99.7 percent, with variations within 5 percent.

The method is applicable to milk containing up to 100 mg. percent of lactic acid. It is not affected by high sugar content or the presence of products of lipolysis. Preservation of the sample with mercuric chloride, formalin, boric acid or phenol up to 0.2 percent did not influence the results, nor did sodium chloride up to 0.5 percent or 0.2 percent of sodium citrate or disodium phosphate. Neutralization of a soured sample appears to increase the lactic acid values slightly.

Digest from "Lactic Acid in Dairy Products. I. Application of the Hillig Method," by I. A. Gould, Journal of Dairy Science, vol. 27, 743-52, September, 1944.

STARCH

High Viscosity Starch

TRANSLUCENCE, absence of flavor and the stickiness or "gluiness" of a cooked solution characterize the starches from glutinous corn and sorghum which are now being produced to replace tapioca.

Data obtained at the Northern Regional Research Laboratory indicate that there is some difference in chemical composition between the glutinous and nonglutinous starches. They show very definite differences in microstructure after partial gelatinization.

Glutinous corn easily can be processed for high-quality starch. Glutinous sorghum may contain a colored nucellar layer. Such sorghums require treatment (similar to the pearling of barley) to remove the pigmented husks before milling, in order to obtain white starch.

In the laboratory, grains were steeped in an SO_2 solution for 24 hours, drained, then ground to pass a ⅛-in. plate. When a thin slurry from the ground grain is worked over a suitable bolting cloth, separation can be made from germ, bran and larger fragments of the kernel. Centrifuging of the filtrate separates the starch from protein and other suspended matter that has passed through the cloth. The starch must be washed several times with distilled water and dried below 122 deg. F.

Microscopically, the various corn and sorghum starch granules are practically indistinguishable, but the glutinous starch gives a red or red-brown color with iodine.

The viscosity of a paste made from glutinous starch may be very much reduced by the damage which occurs in some types of grinding. The glutinous starches are susceptible to me-

chanical breakage, giving wedge-shaped fragments. The viscosity of pastes made from powdered starch is markedly lower than that of pastes from an unpowdered material, and approaches that of nonglutinous and even thin-boiling starches.

Viscosity is also unfavorably affected by the use of a steep water too high in SO_2.

Digest from "Glutinous Corn and Sorghum Starches," by M. M. MacMasters and G. E. Hilbert, Industrial and Engineering Chemistry, vol. 36, 958-63, October, 1944.

NUTRITION

Canned Foods

NUTRITIVE VALUE of canned foods, as indicated by vitamin content, is dealt with in a series of five papers, resulting from the joint program of the National Canners Association and the Can Manufacturers Institute. The results represent 823 samples of commercially canned foods, collected from all districts in the country and representing run-of-mill products from many canneries.

In the table below, maximum and minimum values for each vitamin are reported. Values are in milligrams per 100 grams of combined solids and liquids.

Vitamin C was determined with 2,6-dichlorobenzenoneindophenol. Vitamin A was determined colorimetrically, using an Evelyn photoelectric colorimeter. A modified thiochrome method, including enzymatic digestion, was used for thiamine. Niacin was determined by the microbiological assay method originally described by Snell and Wright, with modifications. Both pantothenic acid and riboflavin were determined by microbiological methods after enzymatic digestion.

Digest from "The Nutritive Value of Canned Foods I. Introduction and Sampling Procedure," by L. E. Clifcorn; "II. Ascorbic Acid and Carotene or Vitamin A Content," by A. Pressley, C. Ridder, M. C. Smith and E. Caldwell; "III. Thiamine and Niacin," by M. Ives, J. R. Wagner, C. A. Elvehjem and F. M. Strong; "IV. Riboflavin and Pantothenic Acid," by M. L. Thompson, E. Cunningham and E. E. Snell; "V. Distribution of Water Soluble Vitamins Between Solid and Liquid Portions of Canned Vegetables and Fruits," by M. K. Brush, W. F. Hinman and E. G. Halliday. The Journal of Nutrition, vol. 28, 101-40, August, 1944.

Range of Vitamin Values in Commercial Canned Products

	Ascorbic acid	Carotene	Thiamine HCl	Niacin	Calcium panto-thenate	Riboflavin
Fruits**						
Apricots	1.1- 5.7	0.93-1.74	0.008-0.026	0.20-0.48	0.045-0.20	0.012-0.039
Grapefruit	20.3-32.3	tr-0.02	0.007-0.046	0.13-0.35	0.063-0.19	0.008-0.039
Peaches, cling	2.0- 5.7	0.19-0.51	0.005-0.011	0.48-1.18	0.017-0.065	0.013-0.030
free	1.4- 3.7	0.09-0.28	0.005-0.011	0.34-0.90	0.020-0.13	0.009-0.034
Pears	tr- 2.5	tr-0.002	0.005-0.012	0.06-0.28	0.008-0.041	0.009-0.032
Pineapple	0.8- 7.0	0.01-0.04	0.053-0.087	0.12-0.20	0.053-0.15	0.006-0.030
Prunes	tr- 3.0	0.44-0.89	0.017-0.039	0.19-0.47	0.027-0.085	0.019-0.032
Juices						
Grapefruit	26.3-44.7	tr-0.02	0.012-0.050	0.08-0.49	0.065-0.17	0.010-0.033
Orange	33.0-52.4	0.01-0.12	0.033-0.103	0.18-0.30	0.081-0.17	0.012-0.038
Pineapple	3.2-14.2	0.01-0.04	0.031-0.070	0.16-0.20	0.066-0.18	0.004-0.031
Tomato	2.5-25.2	0.16-0.96	0.014-0.063	0.55-1.77	0.17 -0.39	0.009-0.046
Vegetables						
Asparagus						
green	5.4-25.3	0.22-0.50	0.040-0.122	0.22-1.19	0.072-0.43	0.039-0.19
bleached	11.6-18.1	tr-0.06	0.043-0.055	0.63-0.88	0.092-0.16	0.044-0.073
Beans, green	0.6- 7.3	0.08-0.34	0.011-0.053	0.18-0.60	0.023-0.11	0.018-0.065
Beans, lima	2.5-12.1	0.03-0.18	0.019-0.048	0.32-0.77	0.068-0.17	0.023-0.062
Beets	tr- 4.0	tr-0.05	0.004-0.014	0.06-0.28	0.045-0.12	0.011-0.059
Carrots	1.0- 4.6	4.47-9.44	0.013-0.027	0.19-0.49	0.093-0.21	0.009-0.042
Corn, white	2.0- 6.5	tr-0.11	0.010-0.039	0.46-1.50	0.10 -0.50	0.027-0.064
yellow	1.3- 8.0	0.04-0.16	0.014-0.045	0.53-1.06	0.094-0.32	0.025-0.072
Peas, wrinkled	3.1-13.8	0.15-0.51	0.056-0.188	0.42-2.69	0.081-0.26	0.025-0.10
Alaska	7.4-13.7	0.21-0.31	0.085-0.121	0.68-1.04	0.069-0.18	0.037-0.064
Spinach	3.4-25.9	1.68-4.81	0.009-0.041	0.16-0.64	0.021-0.14	0.024-0.13
Tomatoes	9.5-27.1	0.35-0.96	0.019-0.077	0.41-0.97	0.11 -0.44	0.011-0.050
Processed food						
Beans, baked						
New England	1.9- 4.3	tr-0.05	0.015-0.027	0.15-0.32	0.061-0.11	0.051-0.059
tomato sauce	1.8- 3.5	0.04-0.06	0.053*	0.91*	0.092-0.11	0.019-0.029
Fish						
Mackerel		0.015-0.054	0.021-0.045	4.01-11.4	0.13 -0.48	0.13 -0.29
Salmon, red		0.078-0.102	0.014-0.038	5.95-8.91	0.47 -0.73	0.14 -0.17
pink		0.015-0.023	.....	.....	.....	.....
Sardines, oil		0.021-0.123	0.014-0.042	2.92-7.15	0.44 -0.65	0.09 -0.15
tomato		.....	0.007-0.016	2.36-5.40	0.41 -0.58	0.12 -0.23
Shrimp, dry		0.014-0.023	0.006-0.011	1.10-3.40	0.26 -0.35	0.027-0.037
wet		0.015-0.022	0.004-0.011	0.72-2.52	0.18 -0.22	0.026-0.035
Tuna		0.005-0.010	0.016-0.082	7.60-13.0	0.13 -0.19	0.11 -0.17

*Average
**Apricots, unpeeled halves; grapefruit, segments; peaches, halves of both clingstone and freestone varieties; pineapple, slices; edible portion only of Italian prunes.

DEHYDRATED FOODS

Toughening of Dry Fish

TEXTURE changes which occur during storage of dehydrated fish are significant. The Fishery Technological Laboratory, U. S. Fish and Wildlife Service, has developed a modified tenderness tester which is adapted for use on reconstituted dehydrated fish. It is probably also suitable for other dehydrated foods. A series of knife blades fits exactly into slots in a block through which runs a semicircular groove to hold the sample. The force required to push the blades through a weighted quantity of the sample is read directly on a scale. A standard reconstitution procedure must be used for comparative tests. The instrument is so constructed that it readily can be freed of the material after a test.

A brief memorandum describing the instrument does not mention the kind of dehydrated fish tested, but on six samples given as illustrations the reading in pounds to shear a standard sample was more than doubled in the course of 30 days storage. The author states that organoleptic tests rate the samples in the same relative order, but are not as sensitive to small variations in tenderness.

The test is not suitable for judging quality of an unknown sample, but is designed to permit gathering comparative data over a considerable period of time. For this purpose organoleptic tests are not sufficiently reproducible.

Digest from "Instrument for Measuring Changes in Texture of Dehydrated Fish," by C. F. Shockey, L. G. McKee and W. S. Hamm, Industrial and Engineering Chemistry, Analytical Edition, vol. 16, 638, October, 1944.

Eggs

SUGAR occurring in egg, probably in the form of glucose, can advantageously be removed from whole egg pulp by yeast fermentation preparatory to drying.

Bacterial fermentation to remove this sugar from whites before drying is a well-established commercial practice. Application of the bacterial fermentation to whole egg was suggested by Stewart, Best and Lowe. They used a pure strain of *Pseudomonas*. The present authors report successful use of a yeast, *Saccharomyces apiculatus*.

For experimental purposes the fermentation was carried out by adding 1 percent of the yeast, at 98.7 deg. F. for three hours. These conditions are not considered suitable for commercial practice. Both a vacuum-ice drying method and spray drying were used.

In the accompanying table comparative figures are given for three samples as dried and after 28 days at 98.7 deg. F. Browning of the powder was retarded by the yeast treatment. When the whole egg samples after storage were reconstituted and scrambled there was a pronounced difference in color, with the treated samples clear yellow and the controls appearing burnt. The fermentation does not seem to effect proteolysis or lipolysis, nonprotein nitrogen and free fatty acid of control and treated samples being identical.

Effect of Storage for 28 Days at 98.7 Deg. F.

Treatment of pulp before drying...	Nil	Yeast	Yeast, then lactose
Free sugar as glucose, before drying, percent	0.45	0.01	2.75
Moisture, as dried, percent	4.8	4.7	5.2
pH, initial	8.7	8.8	8.6
stored	7.7	8.5	7.6
Foam at 104 deg. F., ml., initial	460	490	260
stored	180	420	270
Fluorescence, initial	32	29	31
stored	69	47	73
Solubility in KCl, percent, initial..	98	94	94
stored	62	97	90

Compared to sugar-dried egg (10 percent lactose) the yeast-treated samples have about the same creaming and solubility values. Yeast treatment is slightly better in preventing development of fluorescence and change in pH. Addition of sugar is better that yeast treatment for bakery purposes, since the sugared pulp gives a powder with greatly increased foaming power which is retained in storage. In the yeast-treated samples, while foaming power is not lost in storage, the initial value is little better than that for ordinary spray dried eggs.

Experiments are still being carried out to determine whether it is possible to develop conditions for yeast treatment which will not introduce foreign flavors. If this can be done, the process should be of interest for powders to be used in straight egg dishes for which the sugared powder is unsuitable.

Digest from "Dried Egg. VIII. Removal of the Sugar of Egg Pulp Before Drying. A Method of Improving the Storage Life of Spray-Dried Whole Egg," by J. R. Hawthorne and J. Brooks, Journal of the Society of Chemical Industry, vol. 63, 232-4, August, 1944.

SANITATION

Dairy Germicides

LABORATORY TESTS indicate the possible value of several nonchlorine germicidal preparations for use on dairy utensils. The emergency sanitation standards approved by the U. S. Public Health Service Sanitation Advisory Board, in effect, limit the dairy operator to heat (hot water or steam) or chlorine-bearing compounds, both of which may be difficult to obtain in adequate quantities on an average dairy farm under present conditions. Therefore certain other germicides have been tested.

Reagents were tested against cultures of *B. subtilis, E. coli* and *Aerobacter aerogenes,* carried on nutrient beef peptone broth. Diluted germicide solutions were inoculated, then held at 68 deg. F. for periods ranging from 15 seconds to 15 minutes. Loops were plated on standard A.P.H.A. milk agar. Results are reported in terms

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of the number of organisms surviving.

For all three cultures, with initial counts in the range of 5.7 to 8 million organisms per milliliter, a trademarked acid detergent containing a wetting agent, known as Mikro-San, reduced the surviving organisms below 100 per milliliter in 4 minutes at 1:20 concentration and in 15 minutes at 1:40 or 1:50. An alkyl dimethylbenzylammonium chloride compound (Roccal) acted more rapidly, reducing cultures originally in the range of 4 to 5 million per milliliter to less than 100 per milliliter in 30 seconds at a dilution of 1:250 and in from 5 to 10 minutes at 1:1600.

Sodium orthophenylphenate was less effective against *B. subtilis* than against the other two organisms. But it gave a residual count under 100 in 15 seconds at 1:200 dilution, in 1 minute at 1:400 and in 2 minutes at 1:800. Dilutions greater than this were not consistently effective.

The Mikro-San was found to have a tendency to pit tinned copper but had very little effect on aluminum. The alkyl dimethylbenzylammonium chloride is relatively inert to aluminum, copper, tinned copper and tinned iron.

The phenyl phenate compound was found not to interfere with the phosphatase test, which is very sensitive to free phenol. On limited use in actual practice it proved somewhat irritating to the hands of a man who used it daily to wipe cows' udders.

A lye preparation is helpful in soaking rubber milking machine parts, but should not be used elsewhere.

These results are offered as being representative, but they should be checked under actual dairy conditions.

Digest from "Non-chlorine Materials for the Germicidal Treatment of Dairy Utensils," by J. M. Frayer, Vermont Agricultural Experiment Station Bulletin No. 511, May, 1944.

FATS AND OILS

Volume Changes in Fats Indicate Structure

WHEN a solid fat is heated through its plastic range, changes in the rate of thermal expansion can be correlated with the glyceride composition. Curves showing volume change in the fat against temperature consist of a series of straight lines, separated by sharp breaks or transition points. The shape of the curve differentiates clearly between polymorphism and selective softening or melting.

For a group of typical fats the number of linear sections in the curves corresponds in a general way to the known degree of complexity in the glycerides. Since each break in the curve must result from the disappearance of a distinct class of glycerides or glyceride complexes, the authors suggest that dilatometry may eventually be applied to qualitative and quantitative determination of the glyceride composition. Data will first be needed from the examination of simple mixtures of synthetic glycerides of known constitution.

Fats investigated included lard, butterfat, cottonseed oil, peanut oil, a commercial margarine oil, a commercial all-hydrogenated vegetable shortening, three samples of soybean oil hydrogenated to different degrees, a hard butter obtained by fractional crystallization from hydrogenated peanut oil, a mixture of tristearin and soybean oil and a synthetic fat containing equal molar proportions of stearic and oleic acids. The number of linear sections in the dilatometric curves varied from 2 for the stearic-oleic mixture to at least 7 for the all-hydrogenated shortening.

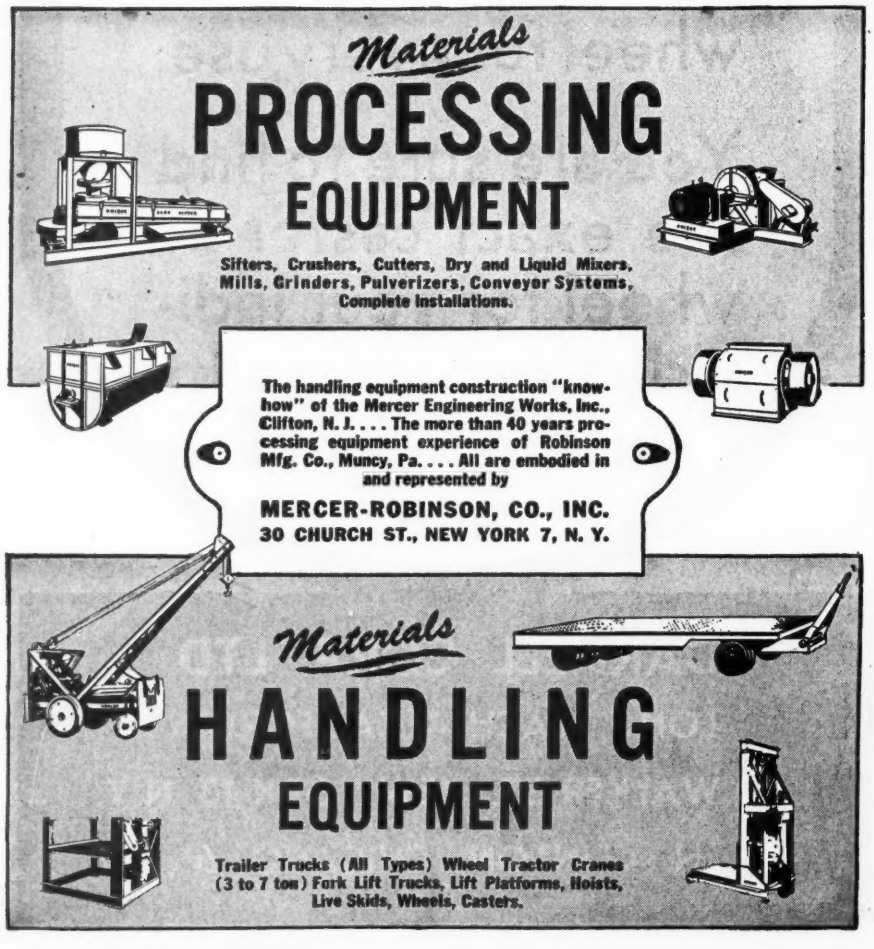
Dilatometric studies of phase changes in fats and oils are simple in principle, but useful reliable results require well designed apparatus and careful experimental technic.

The authors discuss two types of dilatometer. A volumetric instrument may be used conveniently for lower melting fats and where extreme accuracy of measurements is not necessary. Mercury rather than water should be used as the confining liquid, because of the appreciable solubility of water in solid fats.

For precise work an all-glass gravimetric type instrument is recommended. A bulb containing the sample is sealed by fusion to a capillary side arm. A mercury reservoir is attached by a ground glass joint, for ease in removal. A filling device can be attached at the ground glass joint in place of the mercury reservoir, designed to permit high vacuum before introduction of the mercury. Expansion of the fat in the bulb forces mercury into the reservoir. Weighing the mercury permits very accurate determination of volume changes in the sample.

Correction must be applied to the readings to adjust for the thermal expansion of the confining liquid, and sometimes for the expansion of the dilatometer bulb. Results must be expressed as actual volume changes in the fat sample and not as readings of the instrument.

Digest from "Dilatometric Investigations of Fats, II, Dilatometric Behavior of Some Plastic Fats Between 0 deg. C. and Their Melting Points," and "I. Apparatus and Techniques for Fat Dilatometry," by A. E. Bailey and E. A. Kraemer, Oil & Soap, vol. 21, 251-56, September, 1944.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QUESTIONS AND ANSWERS

Mold Prevention

New York—"In this cold storage plant we have a cooler, approximately 25 by 30 ft., inside dimensions, which has become contaminated with mold. If you can give me any advice or recommendations on how to get rid of this condition, I would very much appreciate it."

First you should give the inside surfaces of your cooler a thorough washing down to remove existing surface growth. Follow this with a fungicidal wash or spray. A common agent used to kill vegetative growth of molds is a sodium hypochlorite or calcium hypochlorite solution containing 200 p.p.m. of available chlorine. If products coming into the storage room are likely to be heavily contaminated with mold spores, it may be necessary to use solutions containing as much as 400 p.p.m., in order to make certain that all the spores adhering to the inner surfaces of the cooler are killed.

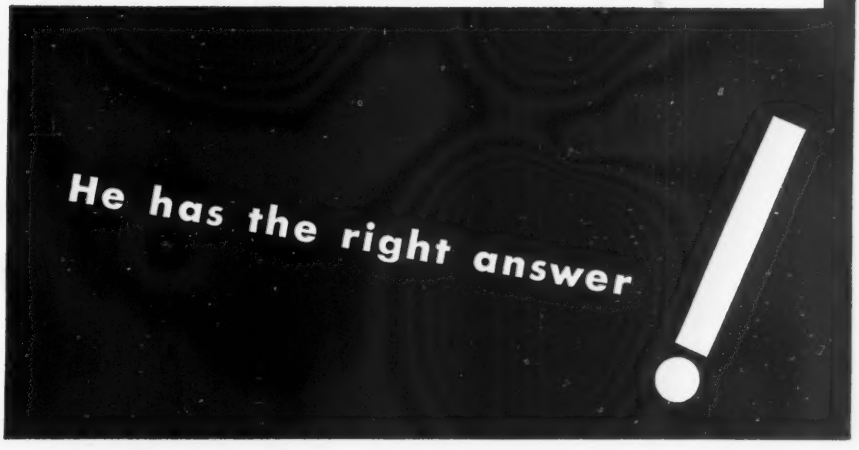
After existing growth has been destroyed, the cooler can be kept reasonably free from mold growth by periodically washing down with 10 percent solutions of chloride of lime, or an equivalent preparation. Chloride of lime has a corrosive effect upon the metal surfaces of the cooling coils. Since washing down may be required as often as two or three times a month, this is an important factor. There are trademarked preparations on the market which are compounded to be effective as fungicides and yet have a minimum of corrosive effect upon the exposed metal surfaces. It would be well to consult with the manufacturers of such preparations for those that will meet your needs.

Fungicidal paints offer another way to combat mold growth on walls, ceilings and other surfaces that can be painted. Ultraviolet lamps also have been used to prevent growth of mold in food plant production areas and storage rooms.

Correction—Gas Packing

In reply to a question to this department, it was stated in the October issue that: "The patents . . . for gas packing are controlled by the American Can Co. . . ." That statement is inaccurate. No one company exercises exclusive patent control over gas packing. Continental Can Co., for instance, has many patents on this subject. Most of the processes, however, are not covered by patents by anyone.

A QUESTION OF CLEANING ?



CLEANING is a more important question than ever in the food industry these days. New equipment, new techniques of handling, processing and packaging food raise new problems in plant sanitation.

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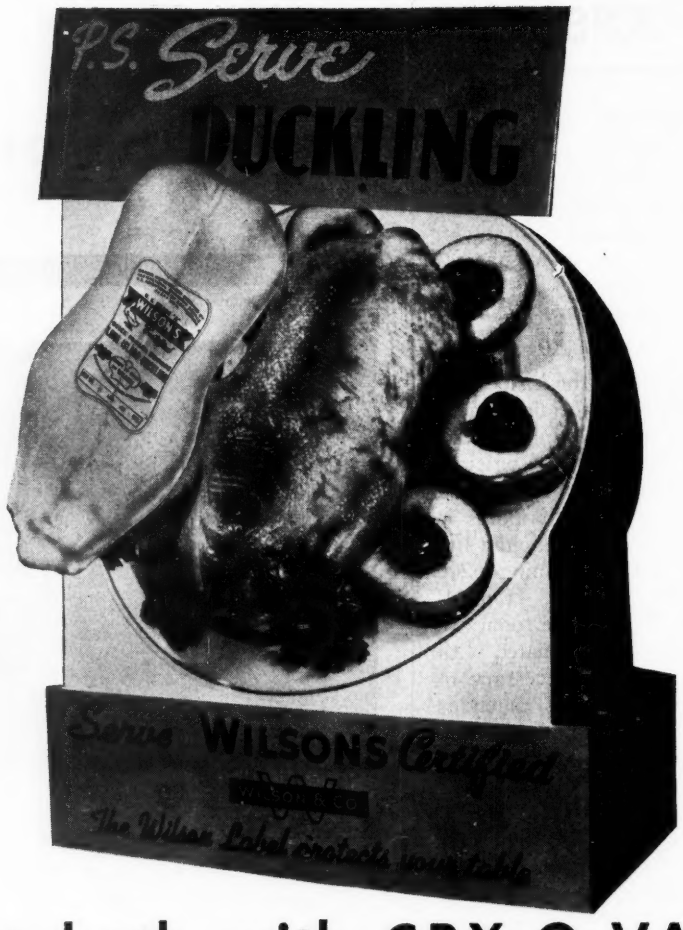

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FORMULAS FOR FOODS

FORMULA NO. 504

Crunch Cake

Granulated sugar	5 lb. 8 oz.
Emulsifying shortening	2 lb.
Salt	2½ oz.
Flavor	to taste
Whole eggs	2 lb. 2 oz.
Liquid skim milk	4 lb. 4 oz.
Cake flour	5 lb.
Baking powder	3½ oz.

Directions

On medium speed for 4 minutes cream together 4 lb. of sugar, the shortening, salt and flavor. Add eggs and cream 3 minutes. On low speed add 2 lb. 4 oz. of milk. Mix 1 minute. Add flour, 1 lb. 8 oz. of sugar and the baking powder. Mix 2 minutes. Add 2 lb. of milk. Mix 3 minutes.

Scale 12 oz. into 8-oz. round layer pans properly prepared. Bake at 360 deg. F.

Pans should be greased, then sprinkled with the following mixture and the cake batter deposited on top:

Brown sugar	8 oz.
Butter	1½ oz.
Salt	¼ oz.
Shredded wheat	3 oz.
Puffed wheat	3 oz.

Rub together the sugar, butter and salt. Add the cereals and mix.

When baked, turn out of the pan immediately. Ice with a thin water icing while still hot.

Formula from Experimental Bakery, Armour & Co.

FORMULA NO. 505

Soya Sweet Dough

Whole eggs	2 lb. 12 oz.
Enzyme-converted corn sirup	3 lb.
Flavor blend*	1 oz.
Salt*	5½ oz.
Low-fat soya flour	1 lb. 11 oz.
Shortening	3 lb. 13 oz.
Sugar	2 lb.
Water*	9 lb.
Yeast	1 lb.
Bread flour	17 lb.

*These must be varied as needed.

Directions

Cream together until light the eggs, sirup, flavor blend, salt, soya flour, shortening and sugar. Dissolve the yeast in part of the water and add, together with the balance of the water. Stir in. Add the bread flour. Mix to a medium soft dough. Temperature of dough when mixed should be 80 deg. F.

Ferment for approximately 2 hours, adjusting the fermentation to allow for the time needed on the make up table. Give three-fourths to full proof with light steam and bake at 375 to 400 deg. F. with medium bottom heat.

This is a suggested formula. Besides variations in the ingredients indicated, 3 lb. 12 oz. of sugar may be substituted for the enzyme-converted corn sirup. Part of the shortening may be butter.

Various flavor combinations may be used, such as cardamom (or coriander), cinnamon and vanilla; coriander, cinnamon and lemon, and so forth.

Formula from A. E. Staley Mfg. Co.

FORMULA NO. 506

Rhubarb Ice

Granulated cane sugar	12 lb.
Corn sirup solids or dextrose	6 lb.
Water	14 qt.
Rhubarb sauce	2 qt.
Locust bean gum	2 oz.
Pectin	1 oz.
Strawberry color	½ oz.
Lemon juice*	1 qt.

*Or 2 oz. of 50 percent citric acid solution

Directions

Combine the cane sugar, corn sirup solids or dextrose, locust bean gum and pectin, mixing thoroughly. Heat the water to 180 deg. F. Sift the dry mixture into the hot water and stir vigorously until it is completely dissolved. Cool this mix to about 50 deg. F. Add the rhubarb sauce, lemon juice or citric acid solution and color by stirring until well mixed.

Put the combined mixture in a freezer and start whipping and freezing until an overrun of about 40 percent is obtained. Remove from freezer to containers and place in a hardening room at about –15 deg. F.

In case citric acid solution is used instead of lemon juice it is necessary to increase the water to 15 quarts.

If the rhubarb sauce is of a pale color it is advisable to step up the color from 0.5 to 0.75 oz.

Formula from B. I. Masurovsky.

FORMULA NO. 507

Cranberry Jelly

Cranberry juice	41 lb.
100-grade citrus pectin, slow set	8 oz.
Sugar	50 lb.
Fruit acid solution	2 fl. oz.

Directions

To prepare the juice, boil 45 lb. of cranberries with just enough water to prevent burning, until thoroughly pulped. Cool to 100 to 110 deg. F., and add ½ oz. of pectinase, previously made into a smooth paste with cold water (Pectinol M, Soluble, made by Rohm and Haas, is recommended). The temperature must be that specified. Stir the pectinase paste thoroughly into the batch, and allow to stand overnight. Allow the batch to cool during this period. On the next day reheat the batch to boiling. Strain the pulp through a sieve or cloth to remove seeds, skins and pulp. By straining through a fairly close-weave muslin a sparkling clear juice can be obtained. The yield is high and this amount should produce about 41 lb. of cranberry juice.

In making the jelly, heat the juice to 180 deg. F. in a kettle. Mix the pectin thoroughly with 4 lb. of granulated sugar. Add this mixture to the juice. Continue to stir while heating to boiling. Boil vigorously for about one-half minute.

Add the remainder of the sugar. Cook rapidly to 219 to 220 deg. F. at sea level (7 to 8 deg. F. above the boiling point of water at the factory site is required). Turn off the steam. Immediately add the fruit acid solution and mix. The acid solution is made by dissolving 1 lb. of citric acid or ½ lb. of tartaric acid (crystals or powder) in 1 pt. of hot water.

Draw off the hot jelly promptly and fill into containers as quickly as possible. Filling and capping should be completed while the product is still above 190 deg. F.

There should be approximately 81 lb. of the finished jelly. The product is slow setting. It should have the same fine texture and consistency as other fruit juice jellies.

Formula from California Fruit Growers Exchange.

FORMULA NO. 508

Nougat Fruit Nut Bar

Granulated sugar	13 lb.
Shortening (preferably part butter)	4 lb.
Standardized invert sugar	4 lb.
Salt	¼ lb.
Flavor (vanilla and maple)	As desired
Whole eggs	4 lb.
Liquid milk	1½ lb.
Flour	10 lb.
Dates or other fruits	4 lb.
Nuts	4 lb.

Directions

Cream the sugar, shortening, standardized invert sugar, salt and flavor until smooth. While creaming, add the eggs slowly and cream very little. Add the milk to the creamed mixture and mix in until distributed. Then add the flour. Mix until smooth.

Add the fruit and chopped nuts. Mix in until distributed. The nuts may be pecans, walnuts or whatever is desired.

Deposit the dough about an inch deep on flour-greased sheet pans. Bake at about 360 deg. F.

After baking cut into rectangular pieces as when making chocolate brownies. Sprinkle with powdered sugar.

Formula from The Nulomoline Co.

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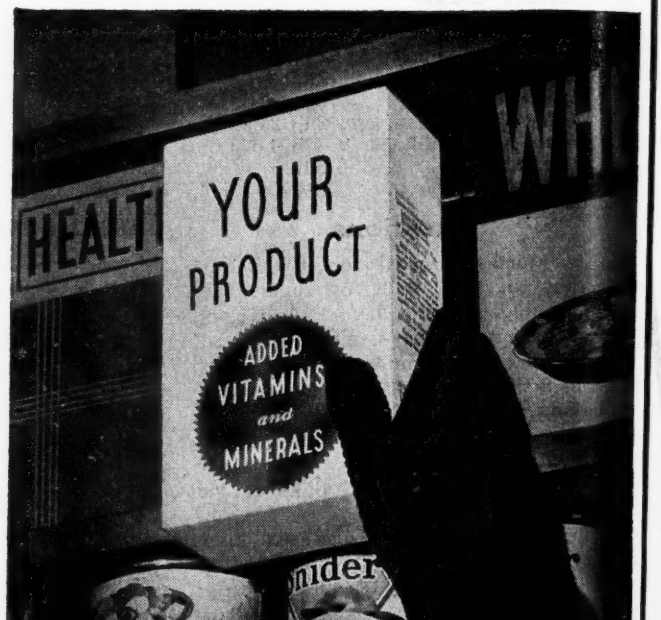


Another reason why label statements, indicating the vitamin content of foods, are receiving greater attention from an enlightened shopping public—a practice that will continue during peacetime.

THE "food fights for freedom" program has brought to the American housewife a new realization of the importance of proper nutrition. Labels are being read, and comparisons are being made more carefully than ever before, for the shopper wants the best possible nutritional value for her money and her ration points.

Product preferences built up during wartime will continue after rationing is but a memory. Those products which today are fulfilling the housewife's demands for full nutritional value will continue to be her postwar favorites.

Building "postwar preference" for your product usually is neither expensive nor difficult. Decisive nutritional advantage often can be obtained by the addition of vitamins and minerals.

The Merck technical staff and laboratories will be glad to help you perfect such factors as adequate distribution and retention of vitamins, and product-control methods.

We suggest that you write us today.

MERCK
FINE CHEMICALS FOR THE PROFESSIONS AND INDUSTRY SINCE 1818

ARMY E NAVY
Speed the Victory with War Bonds

MERCK & CO., Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

New York, N. Y. • Philadelphia, Pa. • St. Louis, Mo. • Elkton, Va. • Chicago, Ill. • Los Angeles, Cal.

In Canada: MERCK & CO., Ltd., Montreal and Toronto

[PUMP TIPS FROM ALLIS-CHALMERS—ONE IN A SERIES]

How to make IMPELLERS Last Longer . . .

CLEARANCES between moving and stationary parts in a centrifugal pump are very small. And when pump and its driving motor are not correctly aligned or weight of piping puts undue strain on casing, every revolution of the shaft throws tremendous extra load and extra wear on all moving parts.

In the case of pumps designed with wearing rings which are attached to the casing, misalignment causes greatly accelerated wear on both rings and impeller — reducing the effective life of both.

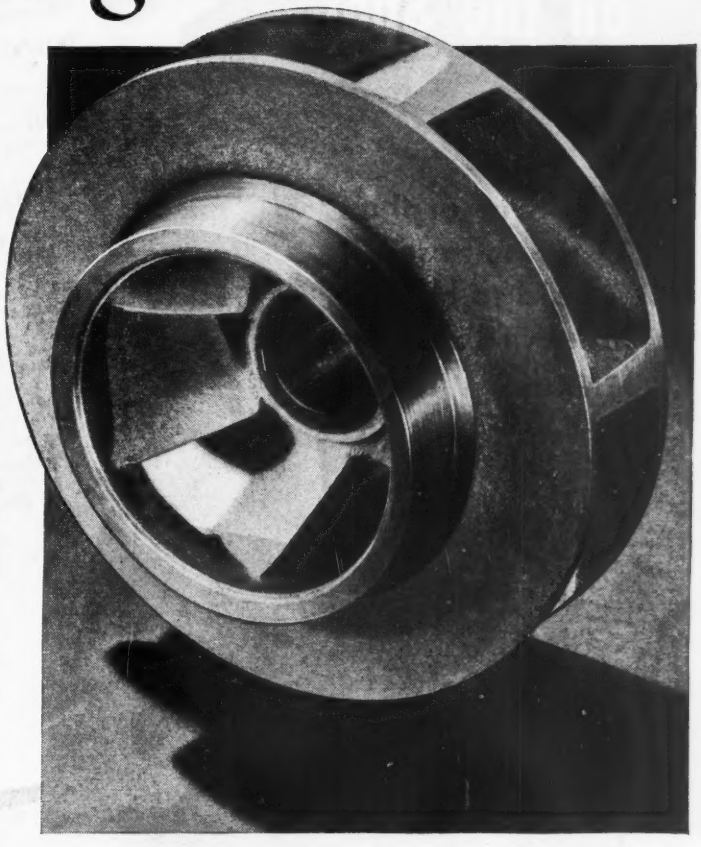
In an effort to eliminate the misalignment problem, A-C engineers developed, for many applications, the "Electrifugal" pump — in which *both* impeller and motor are mounted on *one* shaft and in *one* frame. In such a pump the elements cannot get out of line. Result: wear on all moving parts is greatly reduced.

Besides misalignment, there are still other factors contributing to impeller wear. Regardless of type of pumps you have, here are a few tips which can help you get longer life out of impellers . . .

▸An often overlooked cause of impeller wear is cavitation. For if pump capacity, speed, head and suction lift aren't figured properly, cavitation can eat an impeller away fast. Here's what happens: Rapid movement of impeller blade through liquid produces a cavity behind blade; local high pressure increase drives liquid into metal with terrific force! Moral: Be sure head is right for your pump.

▸If foreign matter is being sucked into your pump it can clog or wear impeller unduly. Where this condition exists, provide the intake end of suction piping with a suitable screen.

▸When you dismantle your pumps (at least once a year), inspect impellers. If they are damaged or blade sections are corroded replace them, but *first* make a thorough search into the possible *causes* for the condition.

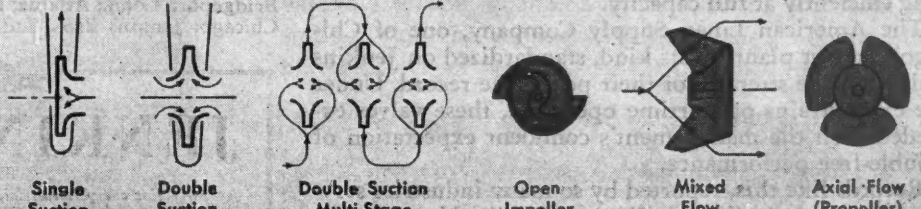


Impellers for Allis-Chalmers "Electrifugal" pumps are supplied in bronze, stainless steel, monel metal or other materials — depending upon the *exact nature* of the liquid to be pumped.

▸If you haven't already done so, send for your *free* copy of "Handbook for Wartime Care of Centrifugal Pumps". This valuable booklet is packed with worthwhile information. Applies to *all* makes of pumps; contains *no* advertising. ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 1688

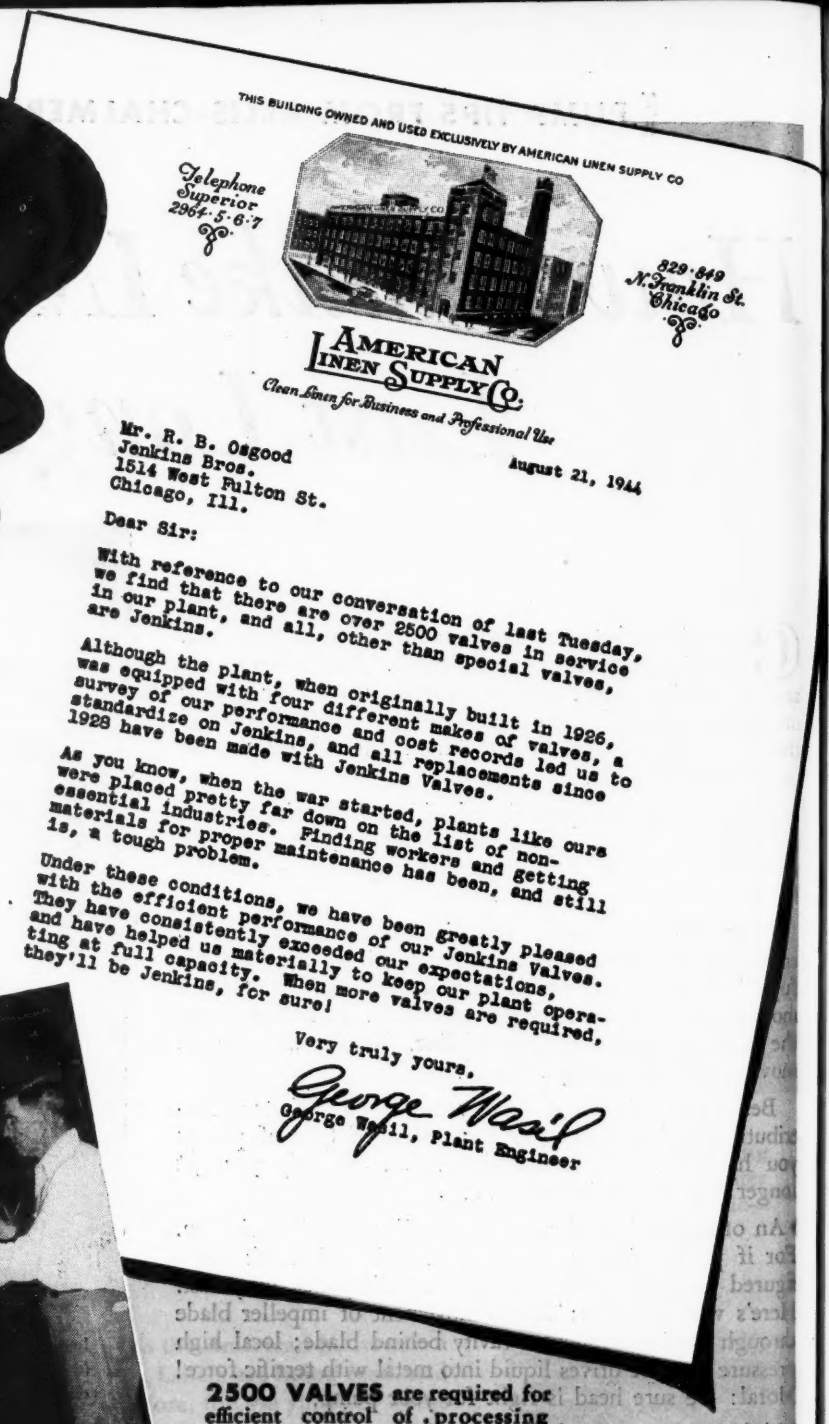
ALLIS-CHALMERS PUMPS

Allis-Chalmers builds all types and variations of pumps shown at right. Capacities from 10 to 150,000 gpm—heads to 2500 lbs.



When War Shortages put Maintenance on the Spot..

—this "war orphan" business found it paid to have standardized on JENKINS VALVES



THIS BUILDING OWNED AND USED EXCLUSIVELY BY AMERICAN LINEN SUPPLY CO

Telephone Superior 2964·5·6·7

829·849 N. Franklin St. Chicago

AMERICAN LINEN SUPPLY CO.

Clean Linen for Business and Professional Use

Mr. R. B. Osgood
Jenkins Bros.
1514 West Fulton St.
Chicago, Ill.

August 21, 1944

Dear Sir:

With reference to our conversation of last Tuesday, we find that there are over 2500 valves in service in our plant, and all, other than special valves, are Jenkins.

Although the plant, when originally built in 1926, was equipped with four different makes of valves, a survey of our performance and cost records led us to standardize on Jenkins, and all replacements since 1928 have been made with Jenkins Valves.

As you know, when the war started, plants like ours were placed pretty far down on the list of non-essential industries. Finding workers and getting materials for proper maintenance has been, and still is, a tough problem.

Under these conditions, we have been greatly pleased with the efficient performance of our Jenkins Valves. They have consistently exceeded our expectations, and have helped us materially to keep our plant operating at full capacity. When more valves are required, they'll be Jenkins, for sure!

Very truly yours,

George Wasil

George Wasil, Plant Engineer

2500 VALVES are required for efficient control of processing fluids in this large linen supply house. Standardization on Jenkins Valves assured dependable performance, simplified maintenance.

For the past three years, linen supply houses and laundries have been among the "orphans" of the war economy, getting only what was left in man power and equipment.

Operating equipment has had to withstand abuse and neglect unknown in peacetime, and still keep plants running efficiently at full capacity.

The American Linen Supply Company, one of Chicago's largest plants of its kind, standardized on Jenkins Valves on the strength of their peacetime record. Under the extra strains of wartime operation, these valves exceeded even the management's confident expectation of trouble-free performance.

Records like this, reported by so many industries serving military as well as civilian needs, all add up to convincing proof that Jenkins Valves "cost least in the long run".

In your plans for reconversion and renovation, it will pay you to specify Jenkins for every valve requirement.

A New Jenkins Price and Discount Sheet, dated October 2, 1944, is now available from your Jenkins Distributor – ask him for your copy.

Jenkins Bros., 80 White St., New York 13; Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; Jenkins Bros., Ltd., Montreal; London.

JENKINS DIAMOND JENKINS MARK

Jenkins Bros.

JENKINS VALVES

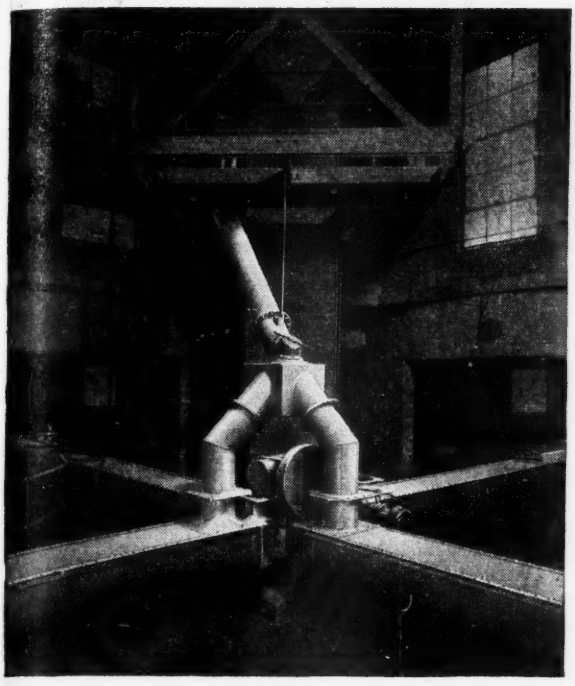
SINCE 1864

For every Industrial, Engineering, Marine and Commercial Service . . . In Bronze, Iron, Cast Steel and Corrosion-resisting Alloys . . . 125 to 600 lbs. pressure.

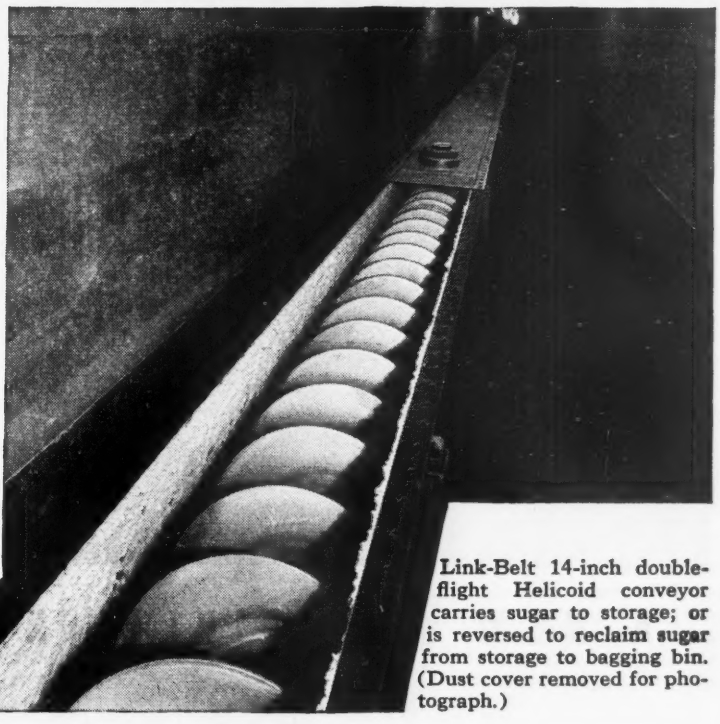
Sold Through Reliable Industrial Distributors Everywhere

How Refined Beet Sugar is Handled Efficiently with

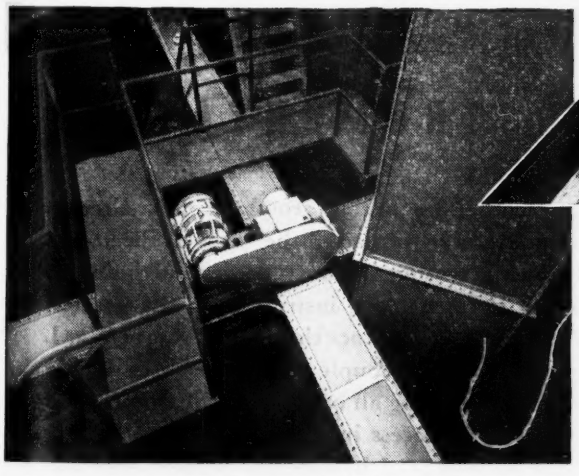
LINK-BELT SCREW CONVEYORS



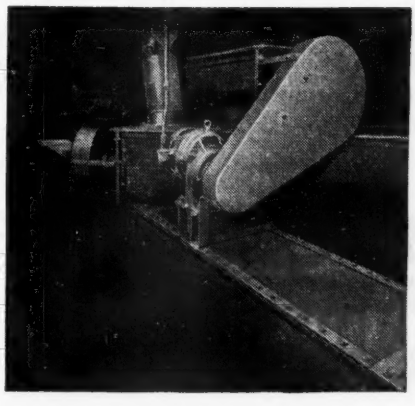
Link-Belt bucket elevator brings sugar up to the four 14-inch double-flight Helicoid conveyors which deliver the sugar into top of storage silos.



Link-Belt 14-inch double-flight Helicoid conveyor carries sugar to storage; or is reversed to reclaim sugar from storage to bagging bin. (Dust cover removed for photograph.)



Reclaiming conveyors, which bring sugar back from bottom of the four silos. At right is the bucket elevator shown in above illustration.



Power drive on main reclaiming conveyor. This conveyor discharges into conveyor at center right, which is reversed to return sugar to bagging bin. Conveyor at lower right feeds into bucket elevator which delivers to top of storage silos.

● Link-Belt Helicoid conveyors and a silo storage system have greatly simplified the storage and handling of sugar at this plant. Helicoid Conveyors carry sugar from driers to storage; the same conveyors are reversed to bring the sugar back when it is needed for bagging. Storage in bags, resulting in re-bagging for shipment, has been eliminated.

For handling many bulk materials—flour, grain, chemicals, etc.—Link-Belt screw conveyors offer many advantages: high efficiency, low first cost, savings in power, maintenance, space. They operate in dust-proof, moisture-proof enclosures, with direct-connected reducer drives.

Engineered Application service and Link-Belt's complete line of conveyors and equipment can be extremely valuable to you when conveying systems are being installed. Call the nearest Link-Belt office, or write for Screw Conveyor Engineering Data Book 1289.

LINK-BELT COMPANY

Chicago 8, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Toronto 8. 9675
Offices, Factory Branch Stores and distributors in principal cities.

"Without fear of contradiction we state that this instrument, with its continuous balance principle, marks the greatest advance in industrial instrumentation since World War I"

A NEW PRINCIPLE IN INSTRUMENTATION

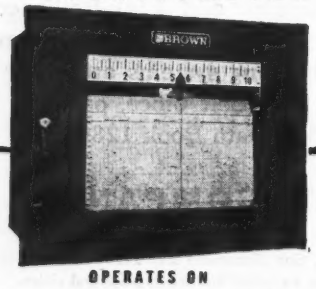
Introduced in 1941 as a flight recorder for testing army and navy aircraft, and since limited largely to direct war projects, the Brown Electronik Potentiometer is now available in increasing quantity to general industry. Without fear of contradiction we state that this instrument is the greatest advance in the art of industrial instrumentation since the days of World War I.

Used with conventional wiring and thermocouple installations, the Brown Electronik Potentiometer is rapidly outmoding all other forms of temperature controllers in the petroleum and other process industries.

Thousands of operation hours have proved its superior performance . . . accuracy . . . sensitivity . . . ruggedness. Its Electronik "Continuous Balance" Operating Principle means precise control every second, with product uniformity hitherto impossible.

If the manufacture of your product involves temperature measurement or control — we invite your inquiry. A Brown engineer will give you a prompt opinion as to what Brown "Continuous Balance" can accomplish in your plant. Address The Brown Instrument Company, 4502 Wayne Avenue, Philadelphia 44, Pennsylvania.

BROWN *Electronik* POTENTIOMETER



OPERATES ON "CONTINUOUS BALANCE" PRINCIPLE

LISTEN . . . The Blue Jacket Choir with Danny O'Neil every Sunday 11:05 to 11:30 A. M., Eastern War Time, C. B. S.

INSTRUMENTS BY **BROWN** CONTROLS BY

MINNEAPOLIS **Honeywell**

Every Belt a Specialist

In Allis-Chalmers' Great New V-Belt Line!

When Allis-Chalmers recommends a certain belt for a certain job, you can be sure it's the *right* belt. Because: 1) the Texrope line is *complete;* 2) Allis-Chalmers invented the multiple V-belt drive, offers engineering advice based on unparalleled experience. Both sound reasons for making Allis-Chalmers your "V-Belt Drive Headquarters."

1

HEAT-RESISTING SUPER-7, made of Buna-S synthetic rubber, has ability to withstand heat built right into it. Standard Super-7 belt, it can successfully operate in ambient temperatures up to 180 degrees F.

2

OIL-RESISTING SUPER-7 specializes in operating under fairly bad oil conditions. Neoprene, a synthetic impervious to oil, grease, other grimy liquids, is the cover for the regular Buna-S Texrope V-belt core.

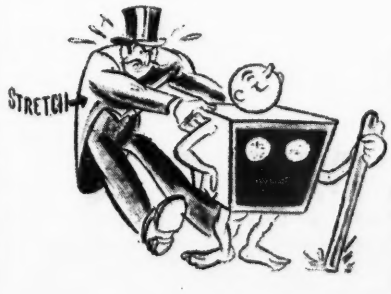
3

OIL-PROOF SUPER-7 is made of solid Neoprene, which is unaffected by most rubber-attacking liquids. It is recommended for drive installations where V-belts are virtually swimming in oil or grease.

4

STATIC-RESISTING SUPER-7 conducts static charge to machine to ground it. Static conducting element is contained throughout belt cover — can't wear off. This belt is used where explosion danger is present.

♪ *Tune in the Boston Symphony, Blue Network, every Sat. Eve.*



5

SUPER-7-STEEL employs endless cables of steel to reduce belt stretch, provide greater horsepower. It is used where V-belt drive centers are hard to adjust, loads to be driven are extra heavy, space is limited.

A 1731

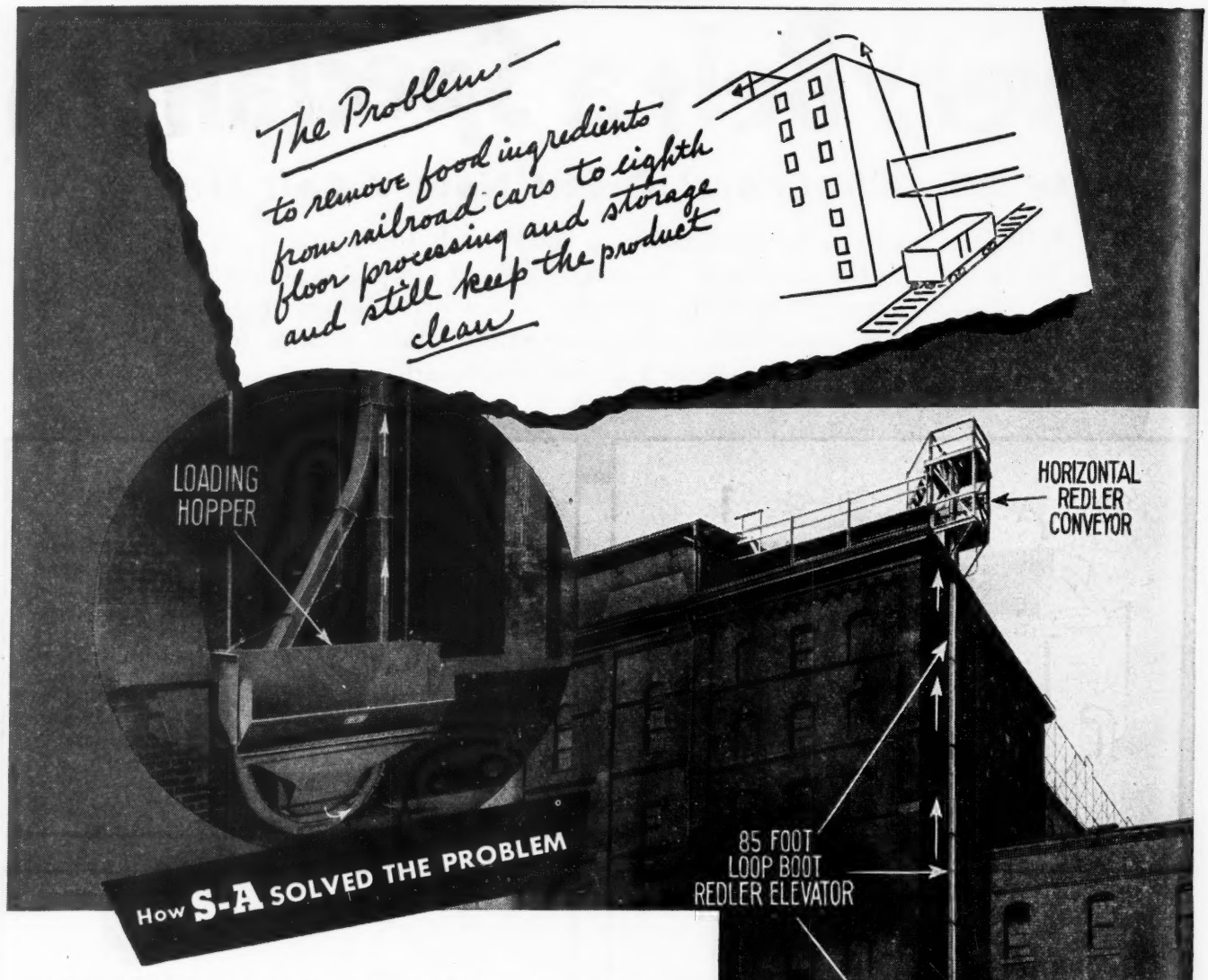
It pays to make

ALLIS-CHALMERS

your

V-BELT DRIVE HEADQUARTERS

Texrope Super-7 V-Belts result from the cooperative research of two great companies—Allis-Chalmers and B. F. Goodrich—and are sold exclusively by A-C.


The Problem—
to remove food ingredients from railroad cars to eighth floor processing and storage and still keep the product clean
LOADING HOPPER
HORIZONTAL REDLER CONVEYOR
85 FOOT LOOP BOOT REDLER ELEVATOR
S-A HAND WINCH
How S-A SOLVED THE PROBLEM

If speed, safety and low handling costs were the only considerations, the REDLER system shown here would have been chosen on that basis alone. But in this case *protection from contamination* of the food products handled was the primary factor. And the six REDLER units of the system, with their sealed, dust-tight casings, provide full assurance of *clean* as well as *efficient* transfer of malt and rice.

In designing this system, S-A engineers again showed their ingenuity in meeting difficult problems with "tailored-to-the-job" solutions. See in the close-up above how the loop boot REDLER, with its movable hopper, receives grain directly from car doors. *No deep pit or track hopper under the rails was needed with this installation.* When a car is emptied, the hopper is quickly raised out of the way on pipe guides by an S-A hand winch.

S-A engineers are fully qualified to help your plant discover similar cost-reducing, efficient and safe methods of handling food products. Write for further information.

STEPHEN S-A ADAMSON MFG. CO.

6 RIDGEWAY AVENUE, AURORA, ILLINOIS — LOS ANGELES, CALIF. ★ BELLEVILLE, ONT.

Designers and Manufacturers of All Types of

BULK MATERIAL HANDLING EQUIPMENT

"What's Cooking" Cooks Faster in PFAUDLER KETTLES

With Pfaudler "precision-built" stainless steel kettles, you can count on greater production through more efficient heat transfer and more thorough mixing action.

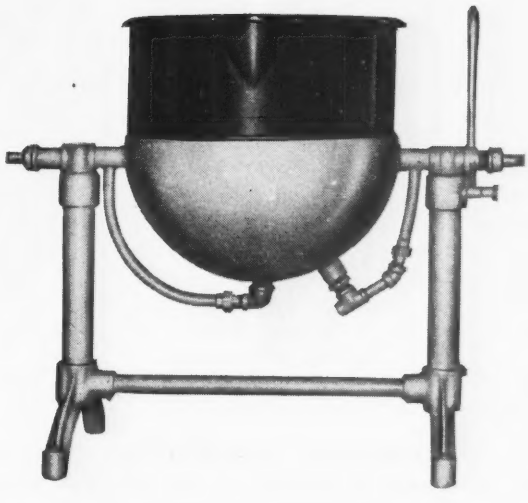
Special (patented) steam nozzle permits quick distribution of steam. Kettles are two-thirds jacketed and designed for working pressures of 60 to 100 lbs. per square inch. Capacities, 30 to 300 gallons.

Hemispherical shaped bottom heads provide maximum strength and quick drainage. Rolled flanges add rigidity and long life. Nickel alloy outlet flush valve (with remote control for operator's safety) is designed for free flow of product and by seating flush with bottom of kettle eliminates pockets where product may lodge. Over-all design permits easy cleaning and maintenance of high sanitation.

All Pfaudler kettles are constructed of stainless steel, No. 4 polish outside and smooth ground inside finish. Jackets available of mild steel, stainless steel or monel metal, all seams welded, ground smooth and polished. Sturdy, welded truss legs provide strong support.

Pfaudler motor-driven stainless steel agitator—with or without adjustable baffles, provides wide degree of mixing action.

Available with or without agitator in stationary or tilting types. Bulletin 819 describing these kettles and other Pfaudler food processing equipment, awaits your request.

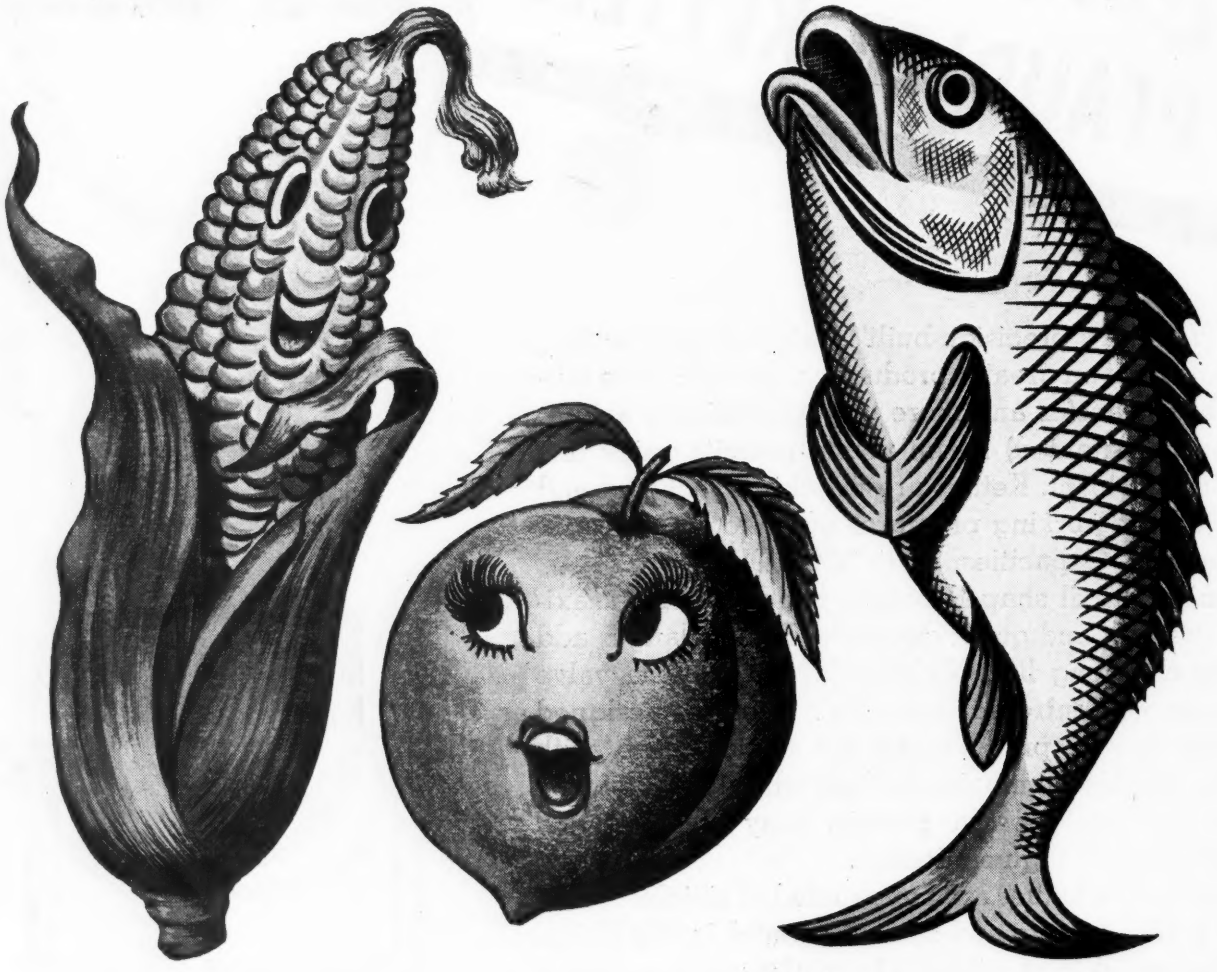


PFAUDLER

THE PFAUDLER CO., Rochester 4, N. Y. Branch Offices: 330 West 42nd St., New York 18, N. Y.; 1442 Conway Bldg., Chicago 2, Ill.; 1325 Howard St., San Francisco 3, Calif.; 455 Paul Brown Bldg., St. Louis 1, Mo.; 7310 Woodward Ave., Detroit 2, Mich.; 1318 1st Nat'l Bank Bldg., Cincinnati 2, O.; 1228 Commercial Trs. Bldg., Philadelphia 2, Pa.; 751 Little Bldg., Boston 16, Mass.; 1034 Washington Bldg., Washington 5, D. C.; Box 982, Chattanooga 1, Tenn.

Spring Song

BIG HIT OF THE WINTER SEASON



Quick-frozen vegetables, fruits, fish — and other tasty delectables — fairly sing with fresh, vitamin-chocked flavor — in season and out — make big hits at the dining table. Specially designed paperboard packages help bring their original goodness home to the consumer.

Container Corporation — working with frozen foods people since the industry's beginning—helped conquer many problems of packaging — moisture-vapor loss, desiccation, oxidation. And by this long experience, our staff confirmed a most important fact: Correct packaging is of vital importance in the proper distribution and merchandising of frozen foods.

We would like to assist you in developing the correct package for your products.

CONTAINER CORPORATION OF AMERICA

FOLDING CARTONS • BOXBOARDS • CORRUGATED AND SOLID-FIBRE SHIPPING CASES

Chicago • New York • Rochester • Medford, Mass. • Philadelphia • Cincinnati • Cleveland • Circleville, Ohio • Detroit • Indianapolis
Wabash • Carthage • Anderson, Ind. • Rock Island • Minneapolis • Baltimore • St. Louis • Fernandina, Florida • Dallas • Ft. Worth • Mason City, Iowa

What do You Say, Doc?

THE "DOCTOR"— McGarvey Eddleman of Allis-Chalmers Norwood Works—is taking a temperature reading during the heat-run test. It's just one precaution that helps Allis-Chalmers build consistently great motors.

NO—THAT'S NOT a sick motor. Actually it's a very *healthy* one. But that's something we must know — through generous sample testing — before Allis-Chalmers motors can tackle jobs for you.

Part of the "physical exam" that motor at the left must pass is the heat run test. Bristling with thermometers, the motor runs at full load — and speed and temperature are recorded for every hour.

Five or six hours can tell you a lot about a motor's characteristics —but it takes more like five or six *years* to tell you its *character.*

And it's the test of time in which Allis-Chalmers motors have established that they are *great* motors. That's why you hear so many engineers say: "You can depend on Allis-Chalmers Motors!"

• • •

If you could meet and talk with the men who build Allis-Chalmers motors, you might be surprised to learn how keenly they are aware of the big *personal* stake they have in every motor they build for you.

They know that factory tests to fully pre-determine how well a motor is built *just don't exist;* that there's still no substitute for responsible craftsmanship.

And they know that when they build great motors for you they're making *friends*—and that no company and its workers can have too many of them. ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 1726

♪ *Tune in the Boston Symphony, Blue Network, Saturday at 8:30 pm, EWT.*

YOU CAN DEPEND ON ALLIS-CHALMERS MOTORS

Wear·Ever

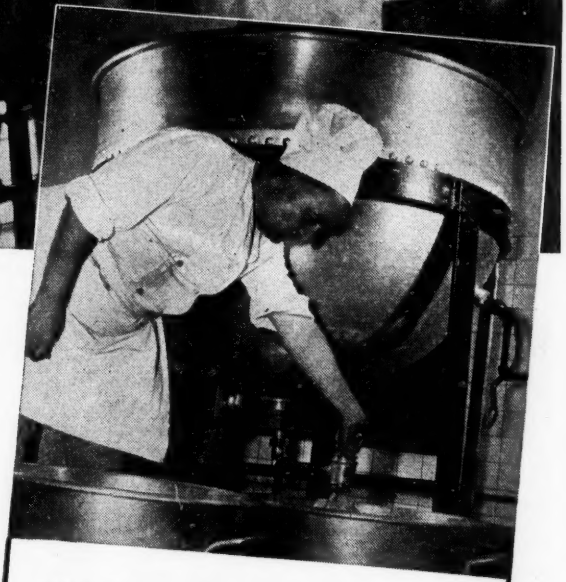
. . on the job and doing it

AT RITZ FOODS,
NEW YORK CITY

WEAR-EVER
TACUCO
ALUMINUM
TRADE MARK
REG. U.S. PAT. OFF.

All over 25 years old, the four kettles shown here are veterans of the last war, having served in the Navy, on shipboard, in World War I! Think of it! Even after obsolete ships are scrapped, durable Wear-Ever aluminum kettles are reinstalled elsewhere and continue to serve faithfully! Like so many other users, Ritz Foods prizes its aluminum kettles . . . depends entirely on Wear-Ever for cooking equipment.

Write us for information about the new, streamlined Wear-Ever designs made of high-strength aluminum alloys, developed and proved in strenuous wartime services. The Aluminum Cooking Utensil Company, 312 Wear-Ever Building, New Kensington, Pa.



BIG BOY AT WORK! Shown here is a 300 gallon Wear-Ever steam kettle at work. About 90% of Ritz Foods' production is at present devoted to making "Field Ration C, Type 3" . . . which we learned was good Irish beef stew! Wear-Ever is a favorite at Ritz Foods, where the finer cooking qualities of aluminum have long been appreciated.

Wear·Ever ALUMINUM

The TRADE NAME "MENASHA" NOW BECOMES MARATHON

1900—*The Menasha Printing Company was established.*

1912—*The Menasha Carton Company was established.*

1917—*The two companies merged and the company name became Menasha Printing and Carton Company.*

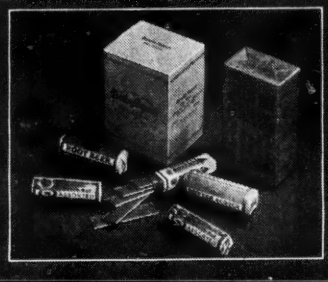
1927—*Marathon Paper Mills Co., chief supplier of Menasha raw materials for many years, purchased the Menasha Printing and Carton Company and the Menasha organization became The Menasha Products Company, Division of Marathon Paper Mills Company.*

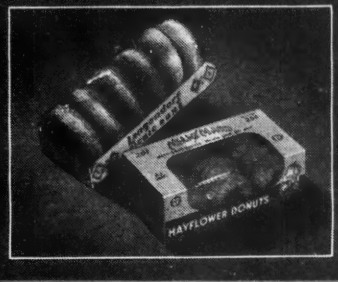
1944—*The name Marathon Corporation was adopted as a simple, uniform corporate name to apply to all plants and offices of the organization.*

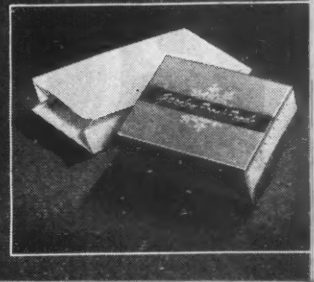
That is the evolution of a distinguished name in food packaging. There will be no change in the company's policies or personnel. Marathon will continue the product improvement and forward-looking developments which have been responsible for the company's progress. The Food Industries will find the Marathon name a worthy successor to the reputable corporate names which it now replaces.

THE NEW MARATHON TRADE MARK

MARATHON CORPORATION • MENASHA, WISCONSIN







First in War, First in Peace—

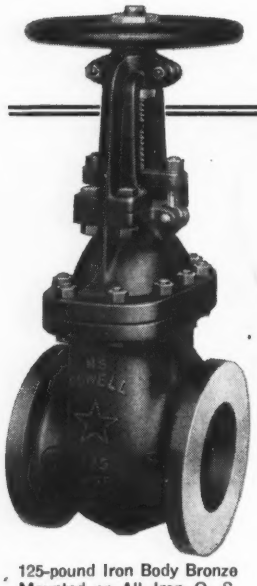
There's always a POWELL Valve for every requirement of Industry.

The "KNOW-HOW" acquired through 98 years of making valves—and valves only—has enabled POWELL Engineering to design valves to meet every problem of wartime flow control. This same "KNOW-HOW" is your assurance for the *post-war* future. Shown here are a few examples of a complete POWELL Line especially adapted to your industry. As new requirements arise, there'll be POWELL Valves to meet them.

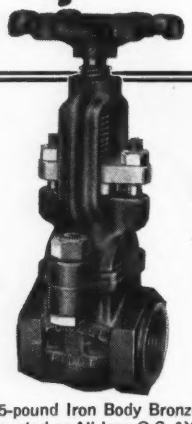
The Wm. Powell Company

Dependable Valves Since 1846

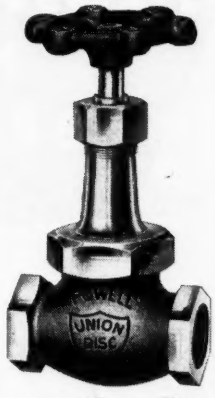
Cincinnati 22, Ohio



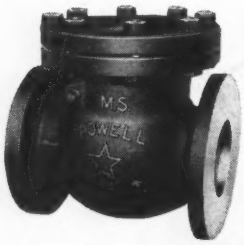
125-pound Iron Body Bronze Mounted or All Iron O. S. & Y. Gate Valve.



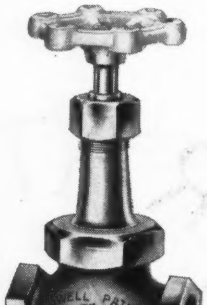
125-pound Iron Body Bronze Mounted or All Iron O.S.&Y. "Pilot" Gate Valve.



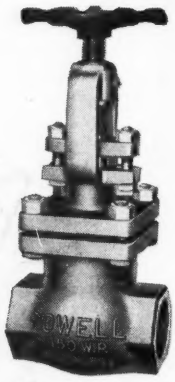
150-pound Bronze Globe Valve with Composition Disc.



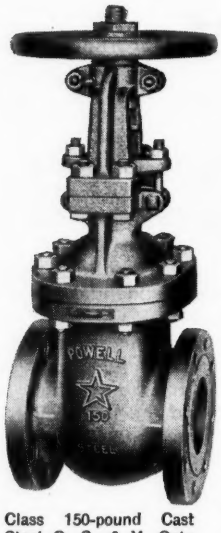
125-pound Iron Body Bronze Mounted Swing Check Valve.



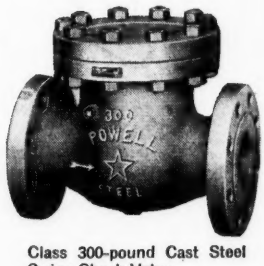
200-pound Bronze Globe Valve with regrindable, renewable seat and disc.



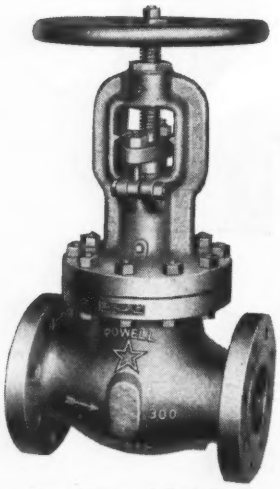
150-pound Stainless Steel O. S. & Y. Gate Valve.



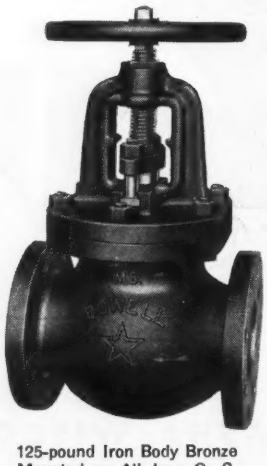
Class 150-pound Cast Steel O. S. & Y. Gate Valve.



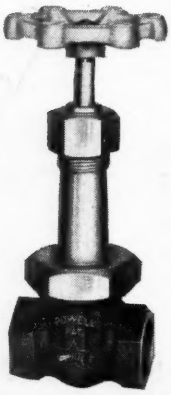
Class 300-pound Cast Steel Swing Check Valve.



Class 300-pound Cast Steel O. S. & Y. Globe Valve.

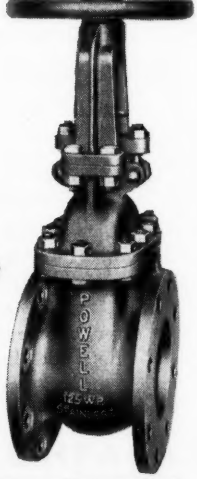


125-pound Iron Body Bronze Mounted or All Iron O. S. & Y. Globe Valve.



200-pound Bronze Gate Valve with renewable disc.

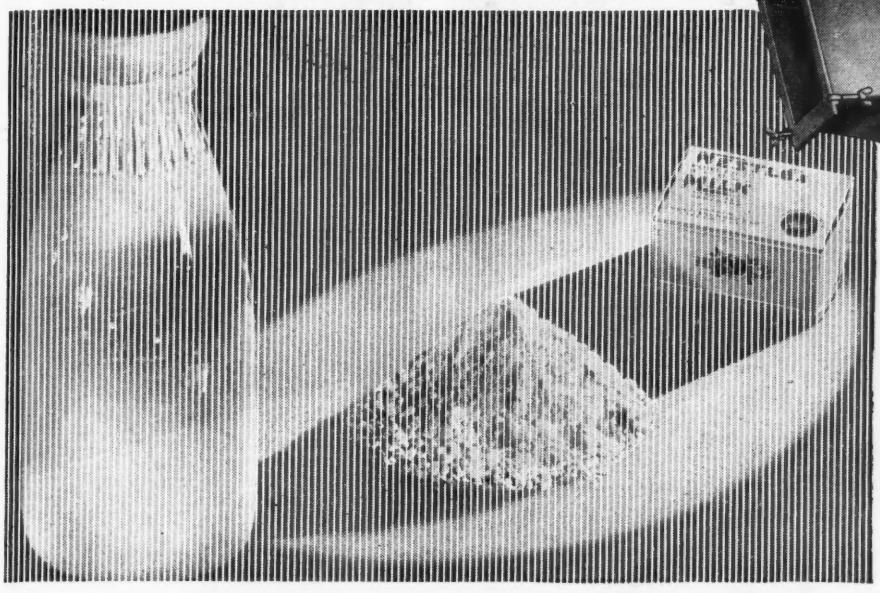
150-pound Stainless Steel O. S. & Y. "Y" Valve.



125-pound Stainless Steel O. S. & Y. Gate Valve.

POWELL VALVES

IN *Dehydrating* Milk....



Buell Powder Collectors
Eliminate Waste

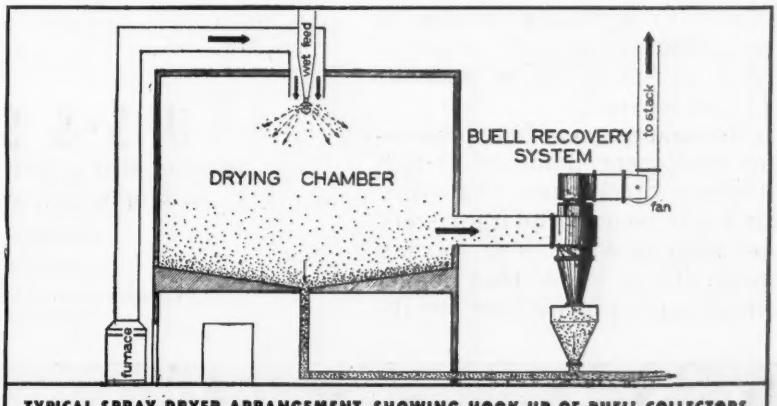
It has been estimated that, without proper provision for recovery, as much as 15% of the milk powder from spray drying operations may be lost in the exhaust. Buell Powder Collectors eliminate this waste, quickly pay for themselves in savings. The material recovered by Buell Collectors is immediately and automatically returned to the regular production.

In spray drying milk, eggs, or any other food products, Buell Powder Collectors should be an integral part of the system. The rapid acceptance of Buell equipment by the food industry and its successful applications to the problems of dehydration are the result of Buell's leadership in dust recovery throughout industry.

For further information, write for factual 28-page book, "Bulletin G-842"

BUELL ENGINEERING COMPANY, INC.
Suite 5000, 8 Cedar Street, New York 5, N.Y.
Sales Representatives in Principal Cities

buell
POWDER RECOVERY SYSTEMS



TYPICAL SPRAY DRYER ARRANGEMENT, SHOWING HOOK-UP OF BUELL COLLECTORS

DESIGNED TO DO A JOB, NOT JUST TO MEET A "SPEC"

STAINLESS STEEL is used in this fruit juice extractor because it must resist not only constant wear, but also the corrosive attacks of fruit acids.

FEEDING A HUNGRY WORLD

FOR two to five years after war's end, say the experts, the appetites of our people and our allies—plus the populations of liberated nations—will continue to strain the resources of food processing plants.

Will your present equipment stand up under the continued strain? If not, now is the time to learn about the speedier, stronger, lighter equipment being made out of stainless steel.

Manufacturers of food processing equipment made of U·S·S Stainless Steel know that they can safely recommend it for every operation in which food touches metal. They know that longer continuous runs without breakdown, higher operating speeds, savings in down time for cleaning, enable that equipment to pay for itself out of operating economies.

U·S·S Stainless Steels are produced in plant units that make nothing else. Their composition, heat treatment and processing are controlled by specially trained men, operating the most advanced equipment in the industry.

Make sure that you have the latest data on stainless steel as it applies to food processing machines and equipment. Our technical experts will be glad to consult with you. Meanwhile, send for your *free* copy of our helpful and informative book, "U·S·S Stainless Steel in the Food Handling and Processing Industries."

U·S·S STAINLESS STEEL

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

USS STEEL — UNITED STATES STEEL

UNITED STATES STEEL

More Power Needed!
Called Dayton V-Belt Distributor—
OK
In adding still more lathes, millers, and other machine-tools to our line-up, and taking additional power off the line shaft, we've run into trouble. The belts in use from our 50 H.P. Motor 10 feet away, were slipping and shuddering, slowing production. That's when we called the Dayton V-Belt Distributor. He studied the problem, recommended that we pull in the motor to a 22 inch center distance, and supplied us with a 5" V-grooved pulley for the motor, and with 9 Dayton V-Belts to drive the flat pulley on the line shaft. Daytons did it. Since then we've run 12 hours a day for about 3 years, able to forget our Dayton Drives completely. "Every Dayton V-Belt is still in good shape. You can hardly tell they've been used at all."

Call Your Dayton V-Belt Distributor He'll Bring You Better Drives, Too

He doesn't care if your problem is tough. He doesn't care if you need only helpful suggestions, or if your job takes difficult calculations. Dayton V-Belt Distributors are practiced, experienced, and competently able to help you solve power transmission problems.

He's familiar with all the better-gripping, smoother flowing, longer lasting advantages you get from Dayton V-Belts. And he is ready to furnish you with names of others like yourself, near-by, who are grateful for their Dayton V-Belt Drives.

He'll bring you every benefit of Dayton Rubber's thirty-eight years of specialized V-Belt experience, and of Dayton's Technical Excellence in the development of synthetic rubber. Call him. You can depend on his Dayton V-Belts, and accept his recommendations with confidence.

CALL YOUR DAYTON V-BELT DISTRIBUTOR OR WRITE DIRECT

THE DAYTON RUBBER MFG. CO., DAYTON 1, OHIO

The World's Largest Manufacturer of V-Belts

Export Division: DAYTON RUBBER EXPORT CORPORATION
38 Pearl St., New York, N.Y., U.S.A. *Cable Address:* WIDBLOCO

MAINTAIN VICTORY SPEEDS—CONSERVE YOUR TIRES

V-Belts by

Dayton Rubber

REG. TRADE MARK THE DAYTON RUBBER MFG. CO.

The Mark of Technical Excellence in Synthetic Rubber

"H-HOUR" in post-war merchandising

WHEN the post-war market becomes a reality, your food product will probably face a stiff battle for consumer preference.

"H-Hour" in that battle comes in the store—that moment of indecision before the shopper buys. Will your product catch and hold her attention? Will it convince her that you offer the best value? Success at this vital moment will depend, to an important degree, on the package.

In the post-war market, where *seeing* promises to be an important part of shopping, transparent Du Pont Cellophane packaging will help answer consumer buying requirements. Besides providing eye-appeal, moistureproof Cellophane will protect the flavor, freshness and quality of the product. It will aid the shopper in getting full value for her food dollar.

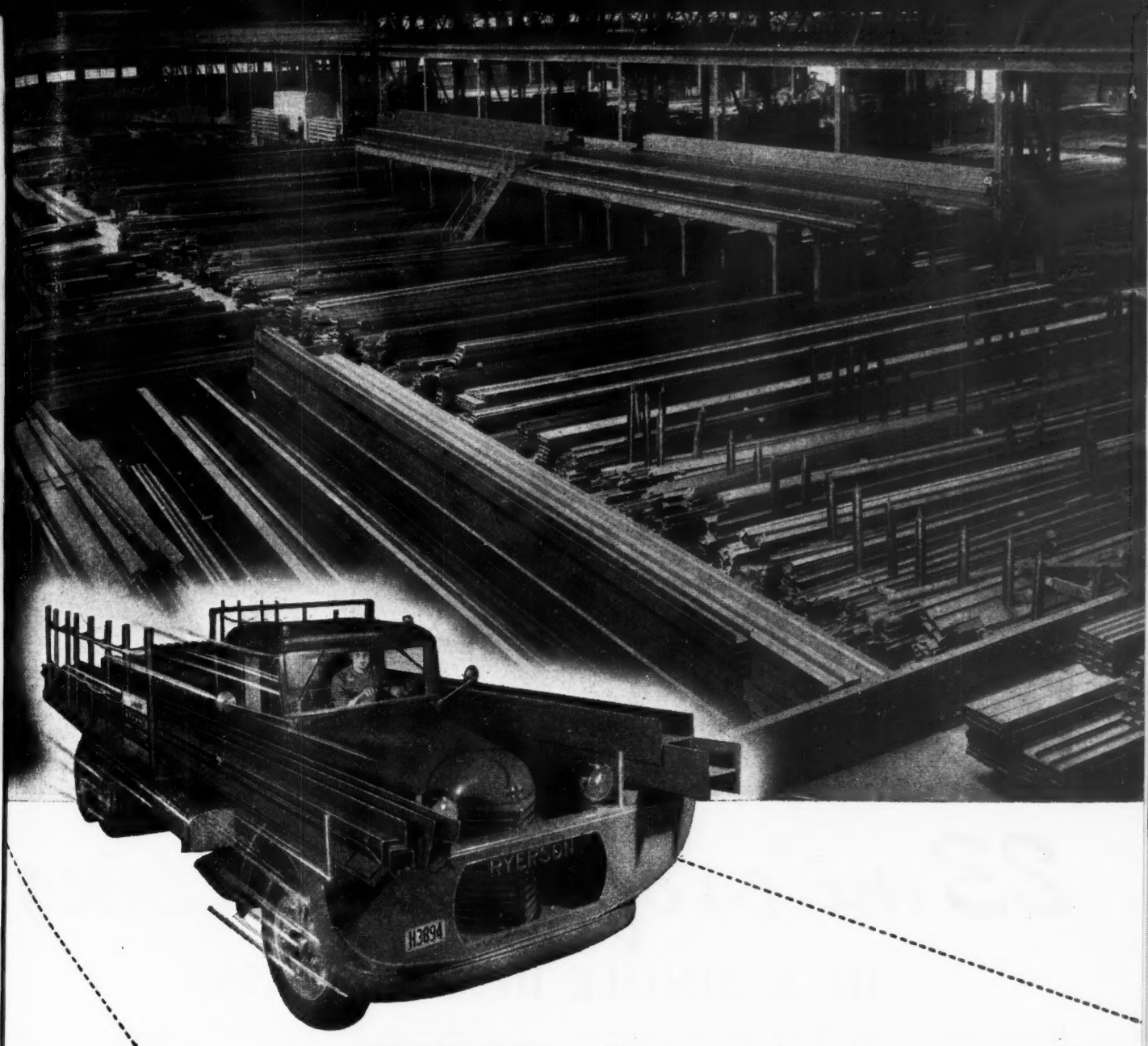
For ideas that may stimulate your post-war package thinking, write for our new free booklet, "Idea Corner for Post-War Package Planners." E. I. du Pont de Nemours & Co. (Inc.), Cellophane Division, Wilmington 98, Delaware.

DuPont Cellophane

Shows what it protects—at low cost

DU PONT

BETTER THINGS FOR BETTER LIVING
...*THROUGH CHEMISTRY*



STEEL of every kind delivered QUICKLY from STOCK

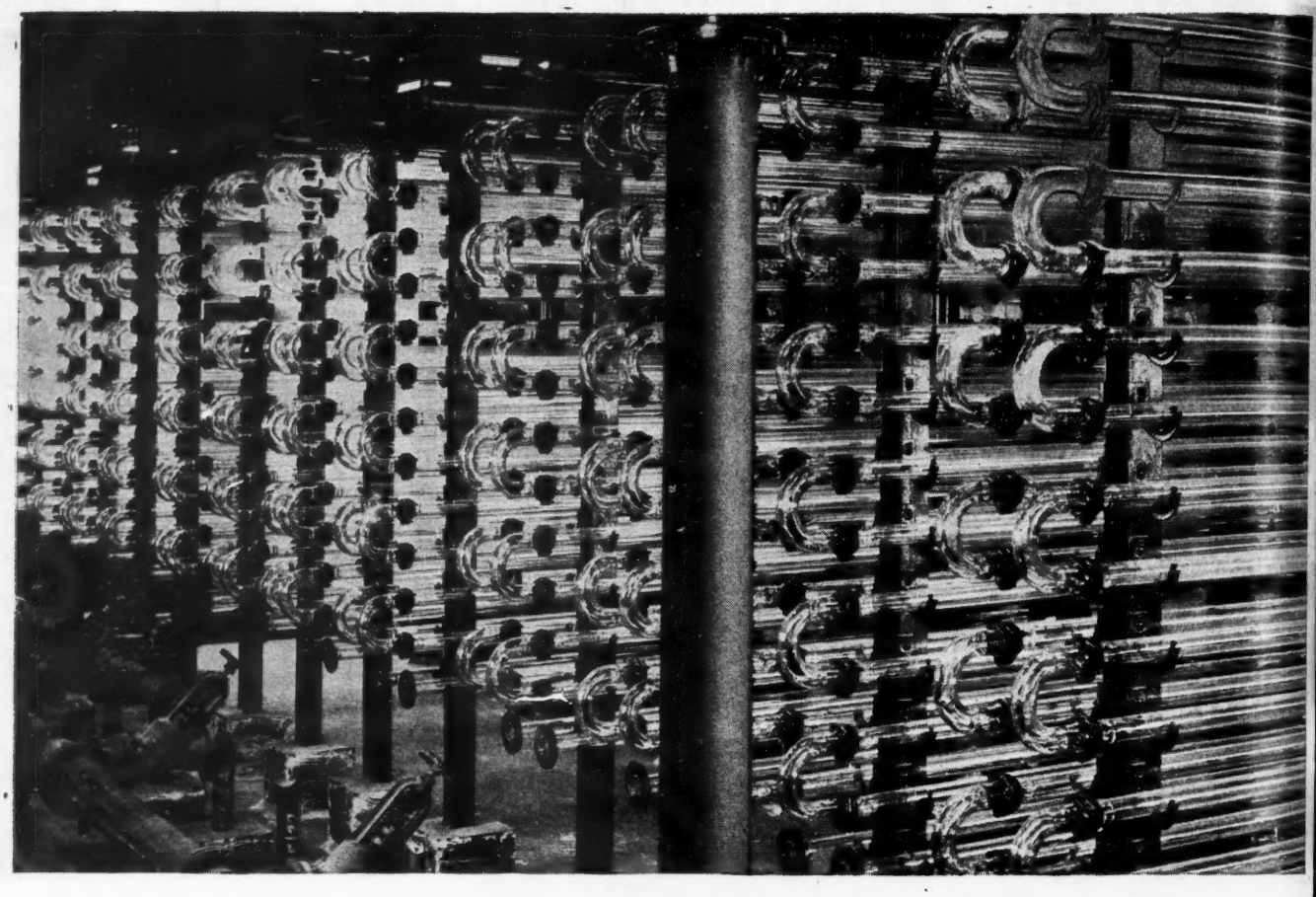
Quick shipment is Ryerson routine. We're hampered, as you are, by shortages of manpower and equipment. But the eleven plant Ryerson network means shorter shipping distances. When you need steel in a hurry, Ryerson comes through on schedule.

Every day hundreds of tons speed from our stocks to war plants and other vital steel users from coast to coast. The huge volume is built on performance. Ryerson has the steel and gets it to you fast. No order is too large for rush handling. None too small for prompt personal attention.

Bars, plates, tubing, structurals, stainless, alloys; whatever your steel requirements, get in touch with Ryerson. In Des Moines or Chillicothe, Worcester or Passaic there's a Ryerson plant nearby that has your steel in stock. More than 10,000 kinds, shapes and sizes are ready to meet your needs. Huge stocks plus immediate handling of every order make this your best source for steel. Write for a Ryerson Stock List.

RYERSON STEEL

Joseph T. Ryerson & Son, Inc., Steel-Service Plants: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston.



23 miles of Pyrex piping

IN A SINGLE INSTALLATION!

Over 23 miles of PYREX Brand Glass Piping are used in these cascade type heat exchangers installed at Basic Magnesium, Inc., Las Vegas, Nevada. Like many others, Basic Magnesium Engineers have learned that PYREX piping is a truly practical plant material—that it will stand up under the most severe operating conditions. Here is what they say:

> "In the Reduction Works Recovery operation, we use 6,240 ft. of 2" PYREX Piping on each acid cooler. We have 20 of these units, or a total of around 125,000 feet of this piping in service under full operation . . . We consider this service to be excellent under our operating conditions as replacements only amount to .008 of 1%...OUR FIRST UNIT WENT INTO OPERATION ON OCTOBER 24, 1942, AND HAS BEEN IN CONTINUOUS SERVICE SINCE."

Whenever you have a difficult piping problem, where corrosive conditions exist, where thermal and mechanical shock are factors, where transparency is an asset, where low cost and low maintenance are important, consider carefully the advantages of PYREX piping. Corning Engineers are at your service on any piping problems. Write: Industrial Sales Dept., FI12, Corning Glass Works, Corning, New York.

Corning Glass Works, Industrial Sales Dept., FI12
Corning, New York

Please send me a copy of your Bulletin 814 on PYREX Piping.

Name.....

Firm.....

Street.....

City and State.....

"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, New York.

CORNING
Glass Works
Corning New York

Pyrex Industrial Glass

TOTALLY ENCLOSED

Non-ventilated type . . . smooth frame motors . . . for use in presence of dust, dirt or foreign matter.

SPLASH PROOF

Complete protection from splashing liquids . . . especially suited for dairies, breweries, chemical process industries, food plants, etc.

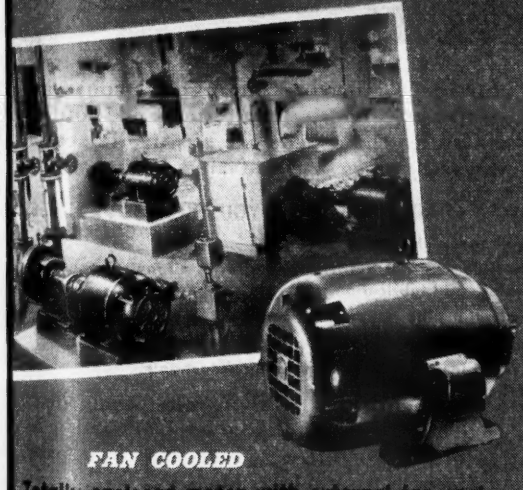
MASTER PROTECTED MOTORS

When you must use motors under adverse operating conditions, select one of Master's Protected Type Motors.

They are available in sizes from ⅛ to 75 HP in a wide variety of electrical and mechanical modifications.

Investigate MASTER'S usual ability to serve you economically with motors that really fit your exact needs.

THE MASTER ELECTRIC COMPANY • DAYTON, OHIO

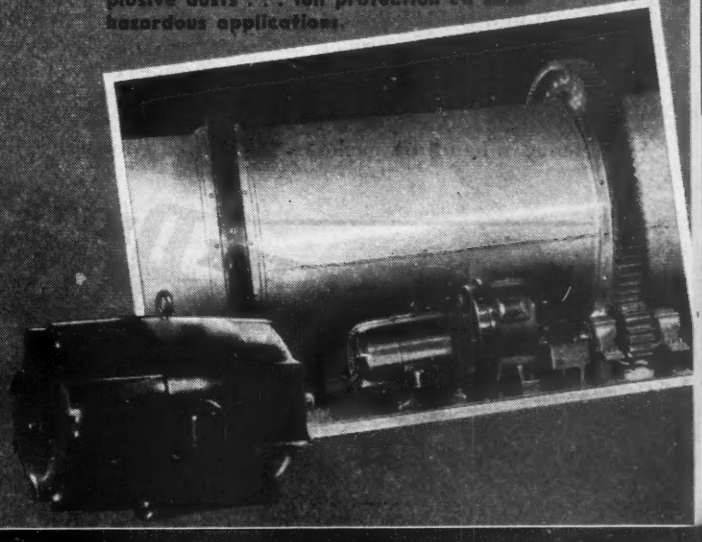


FAN COOLED

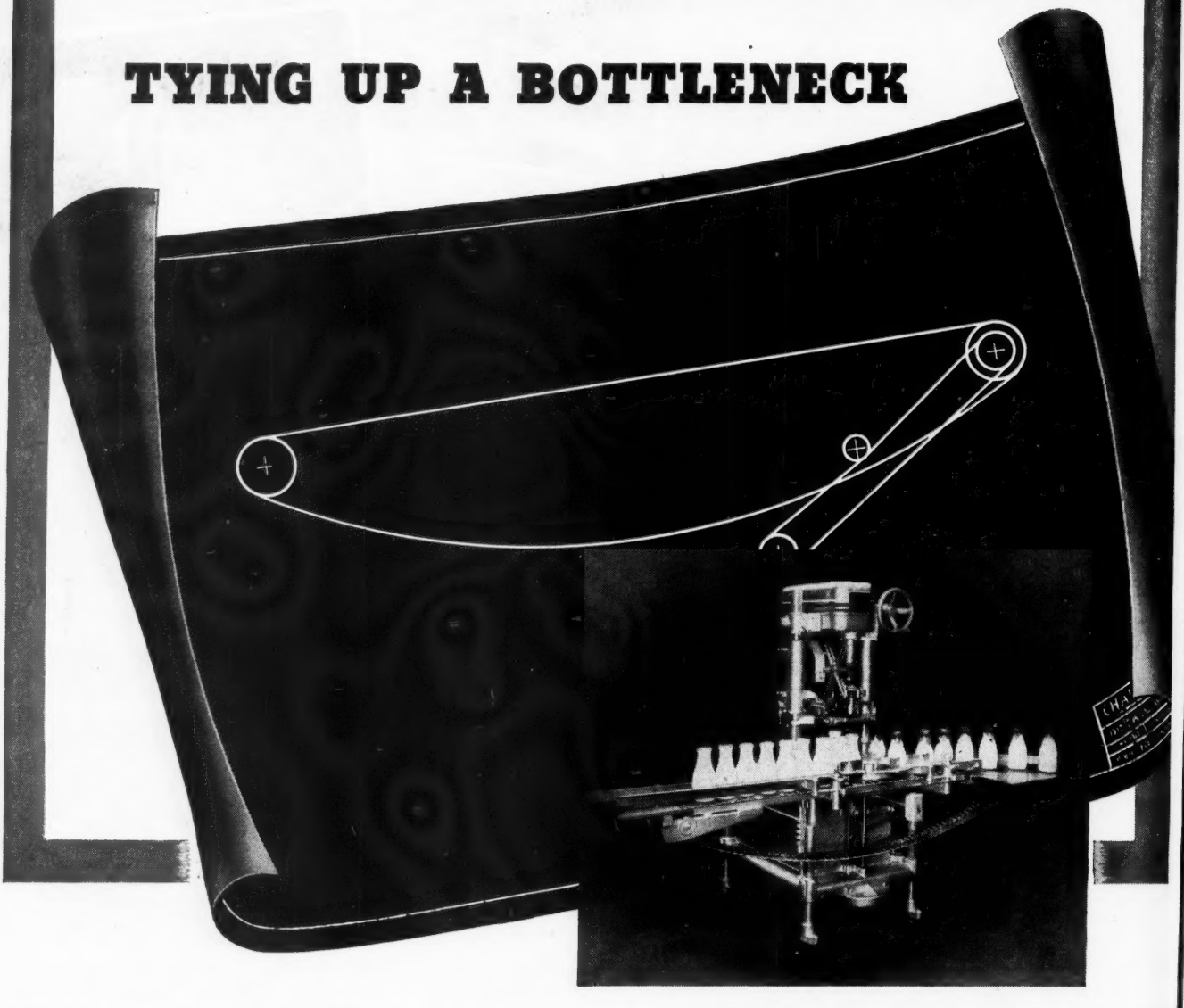
Totally enclosed motor with external fan cooling saves space. Ideal for all applications where there are excessive amounts of dust or dirt.

EXPLOSION PROOF

Underwriters approved for operation in the presence of explosive gasses or explosive dusts . . . full protection on such hazardous applications.



TYING UP A BOTTLENECK



Added protection for milk, a cellophane cover is put over each bottle and tied securely around the neck by this hooding machine. Bottles move smoothly along, never tipping, never hesitating, always right on time for the hooding operation.

IN MACHINES such as this, steady, jerk-free power transmission and conveying are an absolute necessity. Bottles must move smoothly—must be at the right place at the right time to avoid tipping and breakage. That's why you'll find Baldwin here! Baldwin roller chain belt transmits the driving power that operates the hooder and Baldwin C.P.S. (Continuous Plane Surface) conveyor chain conveys the milk bottles safely, steadily along.

The cleanliness of Baldwin chain belts . . . their efficiency in handling packaged or bottled goods have led to their wide adoption for driving, timing and conveying functions in dairies, canneries, bakeries and bottling plants. Baldwin roller chain belts are positive in action, never slip and waste power or cause faulty timing.

BALDWIN ROLLER CHAIN BELTS OFFER YOU THESE ADVANTAGES

1. **Maximum shock-absorbing ability.**
2. **Long life—due to B-D sprocket tooth form, all-metal chain construction, and lubrication.**
3. **Quiet operation—do not create vibration.**
4. **Compact—transmits more horsepower in equal space.**
5. **Simplicity of installation—chain easily detachable.**

For complete information on Baldwin roller chain belts, call your Baldwin man or write for your copy of Catalog M. Baldwin-Duckworth Division of Chain Belt Company, 325 Plainfield Street, Springfield 2, Mass.

BALDWIN

ROLLER CHAIN BELTS

ON CONSTANT GUARD

Against the enemies ...of your products

Will absorbed moisture—or evaporation—damage your packaged products? Is there possibility of your products absorbing foreign odors while in storage or in transit? Or of losing their natural, desirable aroma? Is sifting a problem? Or vermin? Or contamination?

If the answer is "yes" to any of these questions, and if your products are in powdered, granular, crystal or lump form, then Bemis Waterproof Bags are just what the doctor ordered. They give full protection against all these enemies of your products.

How will you know what particular type of bag your products require?

That's one of the tasks of the Bemis Shipping Research Laboratory. With specially designed equipment, chemists and research specialists determine what bag materials and constructions should go into each job.

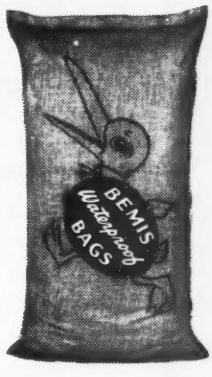
Almost as important as top protection for your products are the major money savings you enjoy. Bemis Waterproof Bags cost less than other containers giving comparable protection. Further, they save storage space on both empty and filled bags—they speed up filling, closing and handling time—they save on shipping costs—and frequently reduce damage claims.

Send the coupon today for the interesting booklet—"A Guide to More Efficient Shipping." Then, if you wish, one of our representatives will call on you to discuss your packaging requirements. No obligation, of course.

1. An inside layer of flexible creped kraft paper impregnated with...
2. a layer of waterproof adhesive that also seals the interstices in the...
3. outside layer of tough, closely woven fabric and cements both layers together.

The outer fabric may be either cotton or burlap. The kind of bonding adhesive depends upon the commodity to be packed. One or more linings of paper and adhesive may be incorporated depending upon the protection needed. Bag seams may be cemented or sewn.

THEY'RE TAILOR-MADE TO YOUR JOB



WATERPROOF DEPARTMENT

BEMIS BRO. BAG CO.

ST. LOUIS • BROOKLYN

BEMIS BRO. BAG CO., 408-J Pine St., St. Louis 2, Mo.; 5122 Second Ave., Brooklyn, N. Y.

Please send your special booklet, "A Guide to More Efficient Shipping," and details about use of Bemis Waterproof Bags for_____ (PRODUCT)

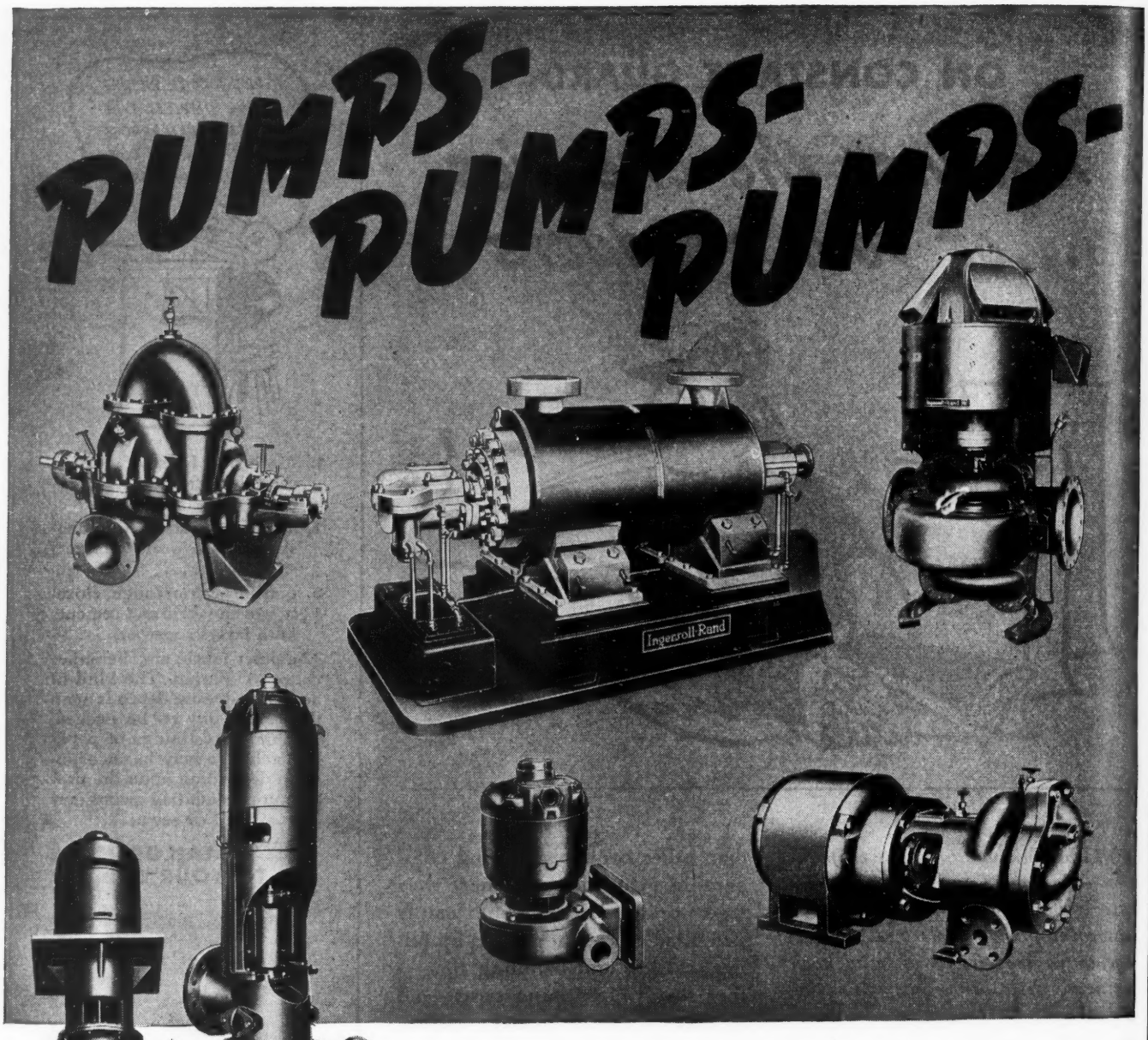
*Firm Name*_____

*Street Address*_____

*City*_____ *State*_____

*Mark for the attention of*_____

PUMPS-PUMPS-PUMPS-



Little pumps...big pumps...special pumps...standard pumps...

Pumps for water...pumps for oil...pumps for food...pumps for chemicals.

Marine pumps...boiler-feed pumps...refinery pumps ...coolant pumps...paper-stock pumps.

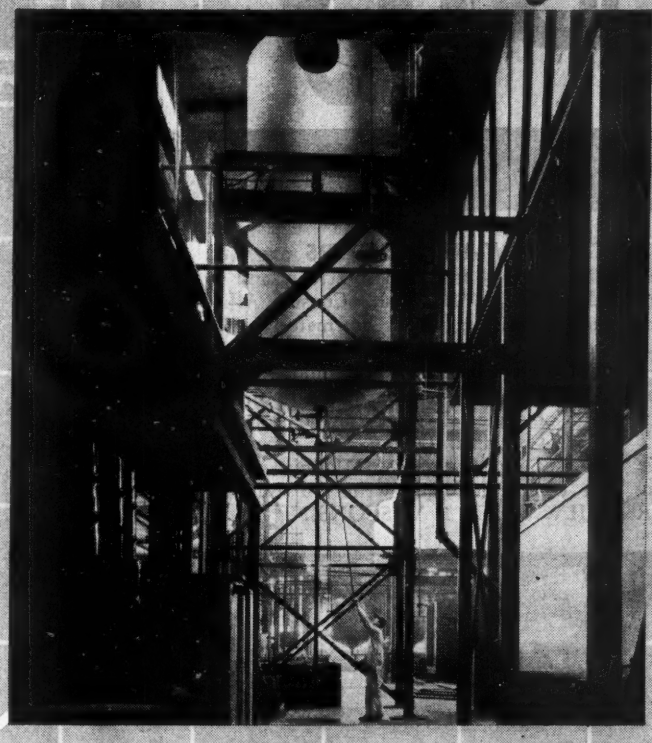
Yes! centrifugal pumps are our business. There is a complete range of sizes to meet any common and many unusual liquid moving problems. An experienced staff of engineers is available to help you find the pump to meet your needs. Ingersoll-Rand Company, Cameron Pump Division, 11 Broadway, New York 4, N. Y.

Ingersoll-Rand

10-520

CENTRIFUGAL PUMPS • CONDENSERS • COMPRESSORS • TURBO BLOWERS • ROCK DRILLS • AIR TOOLS • OIL AND GAS ENGINES

Dowtherm on the job!



Four years of starts and stops—a tough test of flexibility!

The picture above shows a Dowtherm installation used in the deodorization of vegetable oils by a processor located in the Middle West. In addition to the *accurate* control of heat, this operation calls for the frequent starting-up and shutting-down of their 4,000,000-BTU/hr system, a requirement which, they report, Dowtherm has ideally fulfilled during its several years of operation. That is *flexibility*. And since the installation of Dowtherm, early in 1940, it has been necessary to add only one drum of Dowtherm fluid as replacement. That is *economy*.

Dowtherm users throughout the country are proving that the Dowtherm method of precise heat-control in the 400°-725° F. range has many other advantages, too: freedom from the hazards of high pressures . . . uniformity and often improvement of product . . . saving of production and maintenance time . . . combining precision cooling with precision heating . . . eliminating costly production breakdowns. Any or all of these features—inherent in both the Dowtherm liquid and Dowtherm vapor systems—may be helpful in your business. A note to Dow is a quick way to find out.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit
Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle

Dowtherm

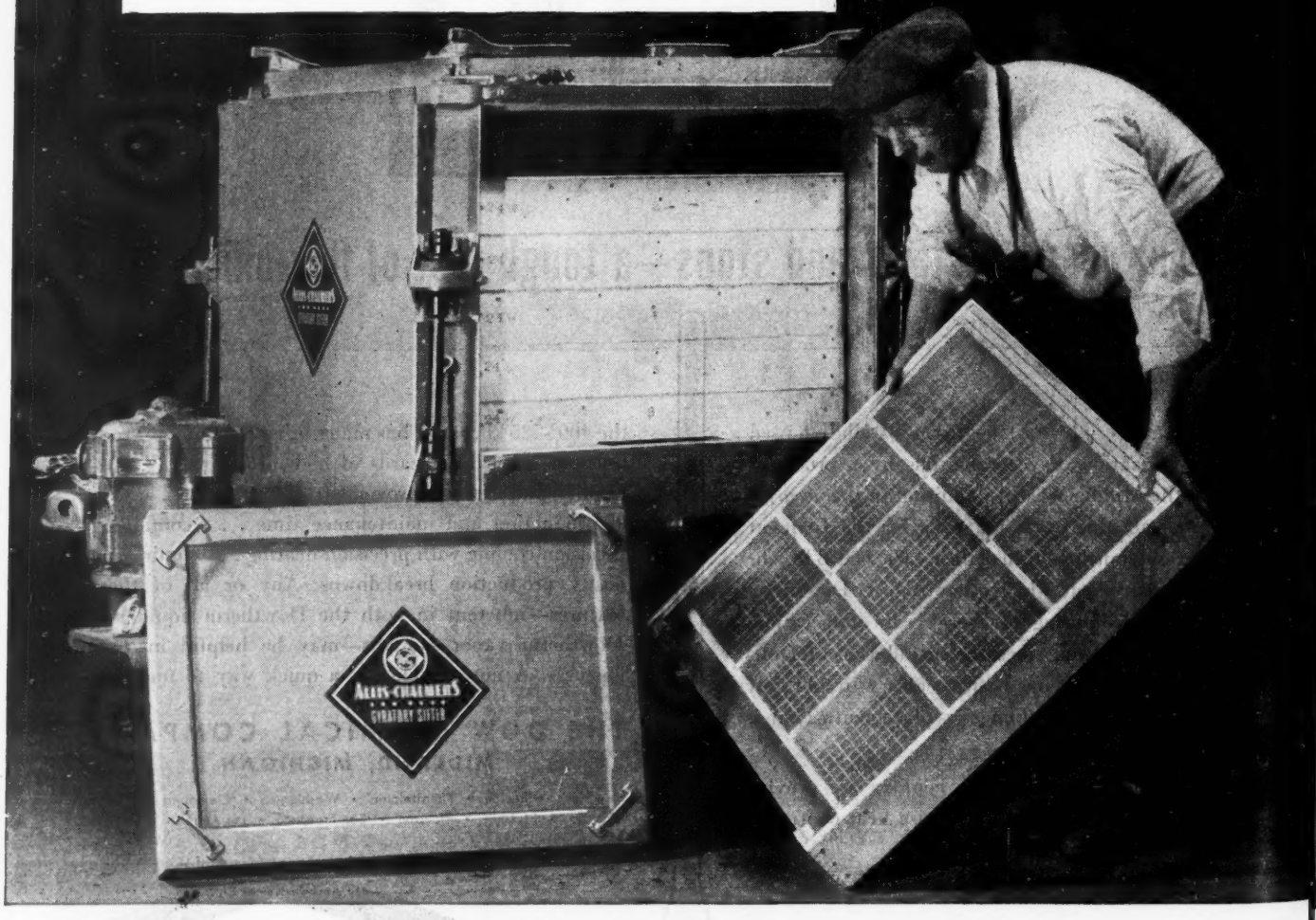
The high-temperature, low-pressure heat transfer medium

DOW
CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

You Buy This...

ALLIS-CHALMERS GYRATORY LOW-HEAD SIFTERS are used for dry sifting of average products from 4 to 150-mesh screen, and in cases of special granular products, up to 200-mesh. Consult Allis-Chalmers regarding special screens for sifting wet or hot materials.

One of the important features of the Low-Head Sifters is the ease with which sieves can be interchanged or replaced. By loosening 4 bolts and tension rod, door can be removed, gaining access to sieves. Other important features: 1 — Compactness. Sifter can be installed in limited floor space. 2 — Self-Contained Design. No expensive millwright work required. 3 — Rubber Mountings. Minimize vibration and pumping action. For complete details write for Bulletin B6124. ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.



WE WORK FOR VICTORY — WE PLAN FOR PEACE

BASIC EQUIPMENT FOR FOOD INDUSTRIES:

ALLIS-

Grain Milling & Extraction for Food & Chemurgical Products

Cereal Reduction & Flaking Mills, Service Elevators

...You Get This!

1 PRODUCTION ANALYSIS

There's no guesswork when you specify Allis-Chalmers Cooperative Engineering. A-C engineers, working with your own staff, analyze your production process — find ways to make *existing* as well as *new* equipment "team up" for greater production.

2 LABORATORY ANALYSIS

Trained engineers in A-C's modern chemical and processing laboratories help solve problems as they arise . . . thoroughly analyze and test samples of your particular product. This is another precaution that the *right* equipment is selected for your plant.

3 UNBIASED RECOMMENDATION

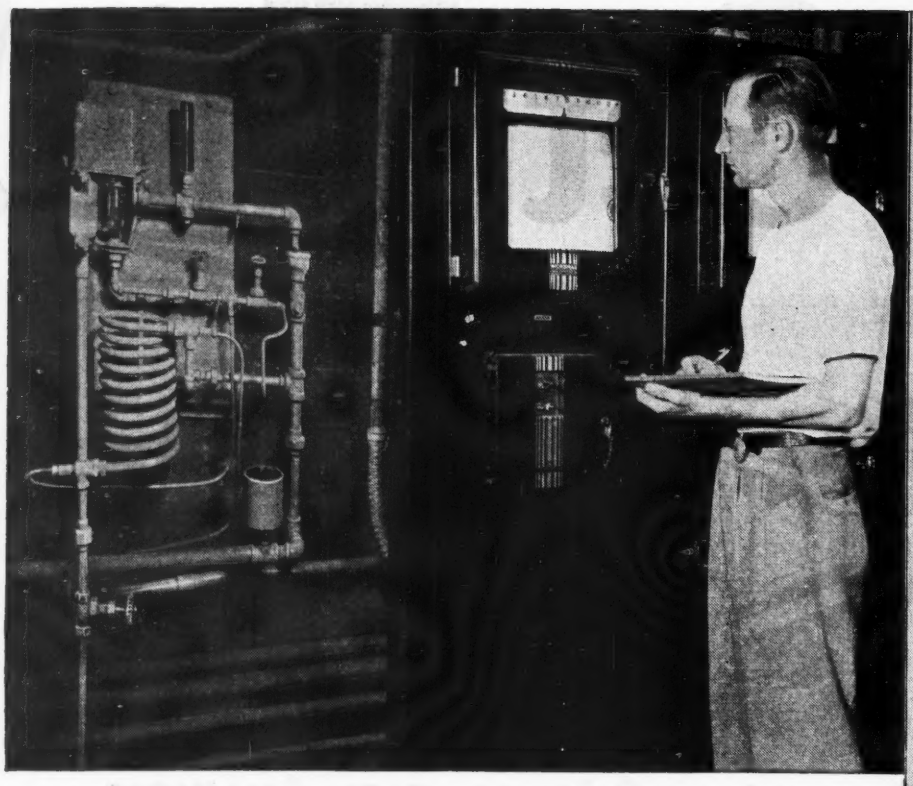
Allis-Chalmers builds *all* types of basic processing machinery; its engineers don't have to "push" *one* type of equipment. Result: their recommendation is unbiased . . . because it is dictated by *exactly what you need,* not an improvised arrangement!

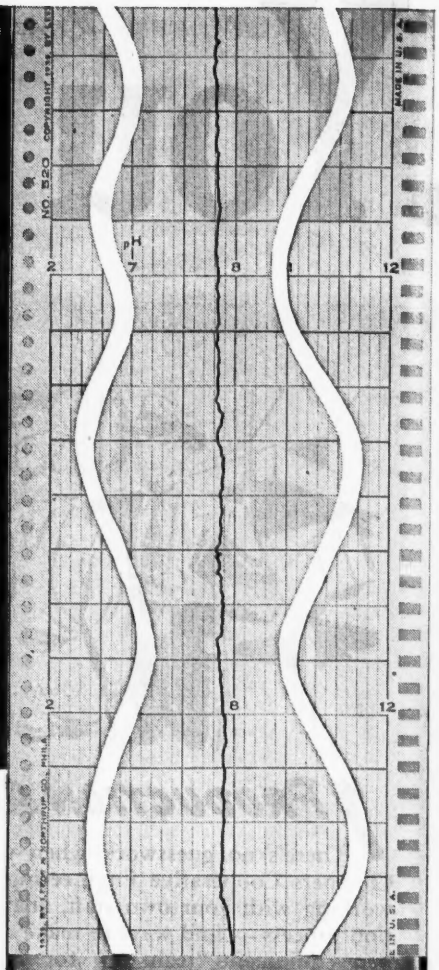
4 EMERGENCY PARTS SERVICE

There's no "sell-and-forget" attitude at A-C. With district offices conveniently located in your area, you are assured of *emergency expediting* when replacements or repairs are needed. In most cases, parts are shipped immediately from stock.

CHALMERS

Rotary & Pan Dryers, Process & Rebolting Sifters | Tractors, Plows, Planters, Cultivators, Harvesters | Motors & Control, Texrope Drives, Power Equipment | Liquid & Vacuum Pumps, Compressors, Blowers





Micromax pH Control, feedwater plant, Wyandotte Chemicals, Inc., Wyandotte, Mich. Right, typical pH chart of finished water in a holding tank.

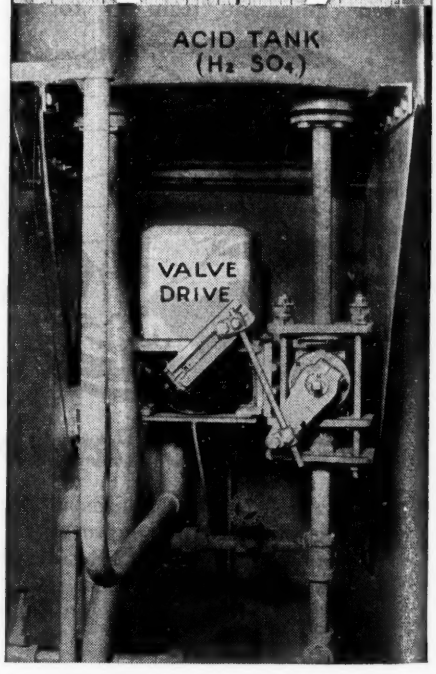
WYANDOTTE PLANT HOLDS pH TO ±0.2 WITH MICROMAX RECORDING CONTROLLER

Faced with the problem of reducing the pH of feedwater from 10.1 to 7.9. Wyandotte Chemicals, Inc., use an L&N Micromax automatic Recording Controller to do the job. The pH is reduced—and held within a band only ±0.2 wide.

The pH of the raw water, from the Detroit River, is 7.5. The water treating cycle begins with a lime soda softening, then a phosphate softening, after which the water is deaerated and filtered. Following filtration, the pH measures 10.1. To reduce it to 7.9, sulfuric acid is added by means of the Micromax Electric Control valve, shown at the right. Finished water, when measured at the end of the treating process, is within ±0.2 of the ideal. Valuable man hours are saved that would be expended in a manual method of control, and waste of acid is eliminated. The Micromax Controller also supplies a continuous graphical record, on a chart almost ten inches wide. It is large and bold enough to be read quickly and accurately by any workman.

Corrosion worries don't exist. The closeness of control at the desired pH value prevents corrosion of piping and simplifies the handling of other factors which are influenced by the pH of the feedwater.

Further details of L&N Micromax automatic pH Recording Controllers are available in Catalog N-96(1), which will be sent on request. If you have a specific pH problem in mind, and will outline it, an L&N engineer will be glad to send further information.



Micromax Electric Control valve drive on reagent sulfuric acid.

Jrl. Ad N-96-701(4)

depends on me!
A Slogan For Every American

LEEDS & NORTHRUP COMPANY, 4912 STENTON AVE., PHILA., PA.
LEEDS & NORTHRUP
MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

That's what dealers told us in a recent survey regarding the packaging of this new frozen food line being pioneered by Bozeman Canning Co., Mount Vernon, Washington. Other comments were:

"Fine pictures show contents without reading labels . . . If I couldn't sell that, I couldn't sell anything . . . Best looking package I ever saw . . . Beautiful to look at with fine protection for contents."

These food retailers see the sales value of these amazingly faithful reproductions on printed cellophane. They like the double barrier of inner box and machine-applied cellophane wrapper which gives superior protection against dehydration and odor contamination. They know that these packages are as good as they look and that they'll stand up against any competition.

Ask us for samples of PICTSWEET wrappers and attractively printed cellophane bags. Let our technical and research men give you suggestions for your postwar packages. They'll be glad to work with you.

CONVERTERS • PRINTERS • LAMINATORS OF FILMS AND FOILS

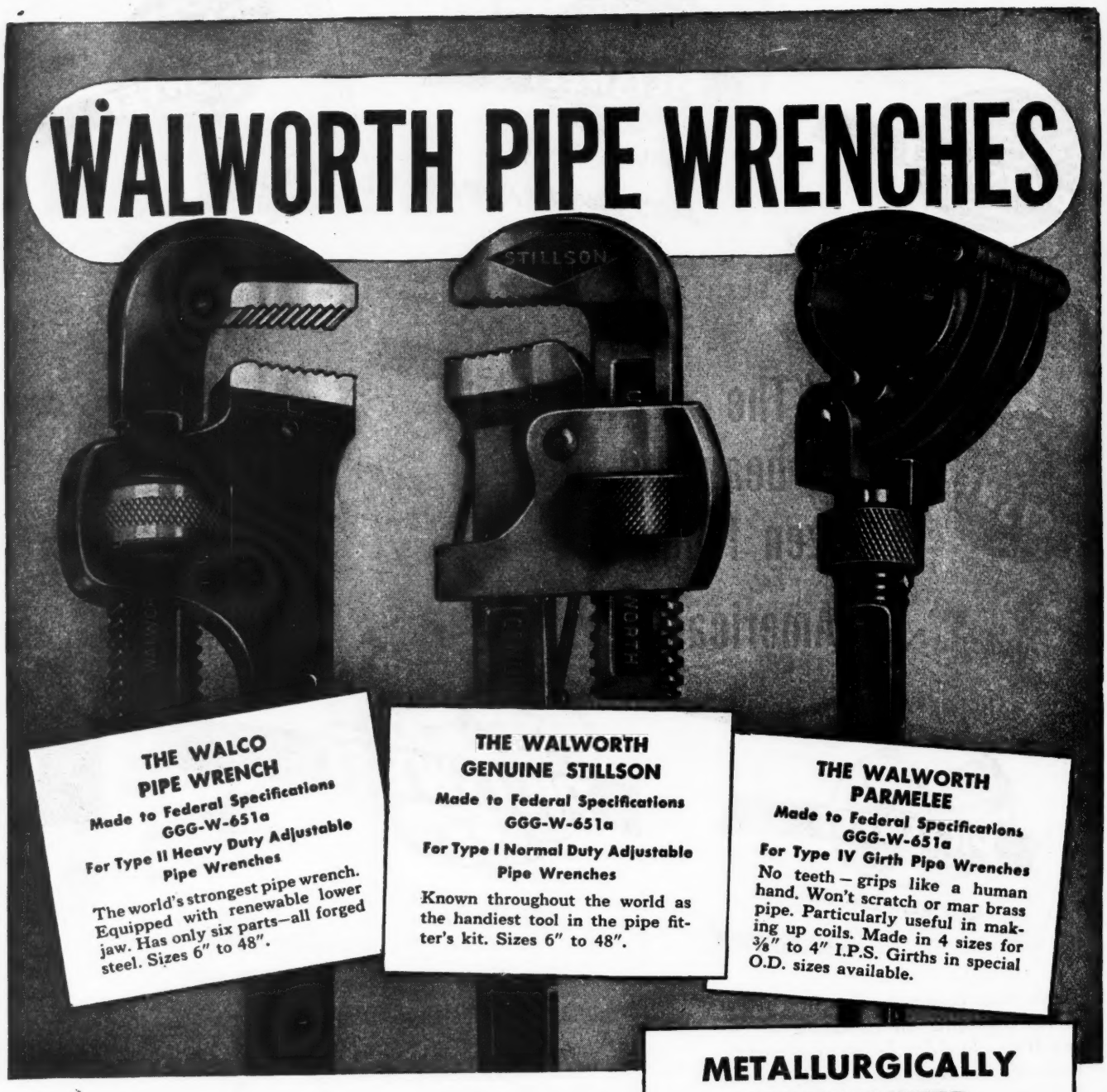
THE DOBECKMUN COMPANY

CLEVELAND 13, OHIO

WESTERN SALES HEADQUARTERS • SAN FRANCISCO 4, CALIF.

OFFICES IN NEW YORK, BOSTON, PHILADELPHIA, CHICAGO AND LOS ANGELES • REPRESENTATIVES EVERYWHERE

WALWORTH PIPE WRENCHES



THE WALCO PIPE WRENCH

Made to Federal Specifications GGG-W-651a

For Type II Heavy Duty Adjustable Pipe Wrenches

The world's strongest pipe wrench. Equipped with renewable lower jaw. Has only six parts—all forged steel. Sizes 6" to 48".

THE WALWORTH GENUINE STILLSON

Made to Federal Specifications GGG-W-651a

For Type I Normal Duty Adjustable Pipe Wrenches

Known throughout the world as the handiest tool in the pipe fitter's kit. Sizes 6" to 48".

THE WALWORTH PARMELEE

Made to Federal Specifications GGG-W-651a

For Type IV Girth Pipe Wrenches

No teeth — grips like a human hand. Won't scratch or mar brass pipe. Particularly useful in making up coils. Made in 4 sizes for ⅜" to 4" I.P.S. Girths in special O.D. sizes available.

These three types of pipe wrenches are manufactured by the Walworth Company, and are noted for their safety, strength, and simplicity of operation.

Walworth, with more than a century of "know-how," also manufactures a complete line of valves, fittings, and pipe. For details see your Walworth distributor, or write on your company letterhead for free copy of Catalog 42.

METALLURGICALLY MODERNIZED

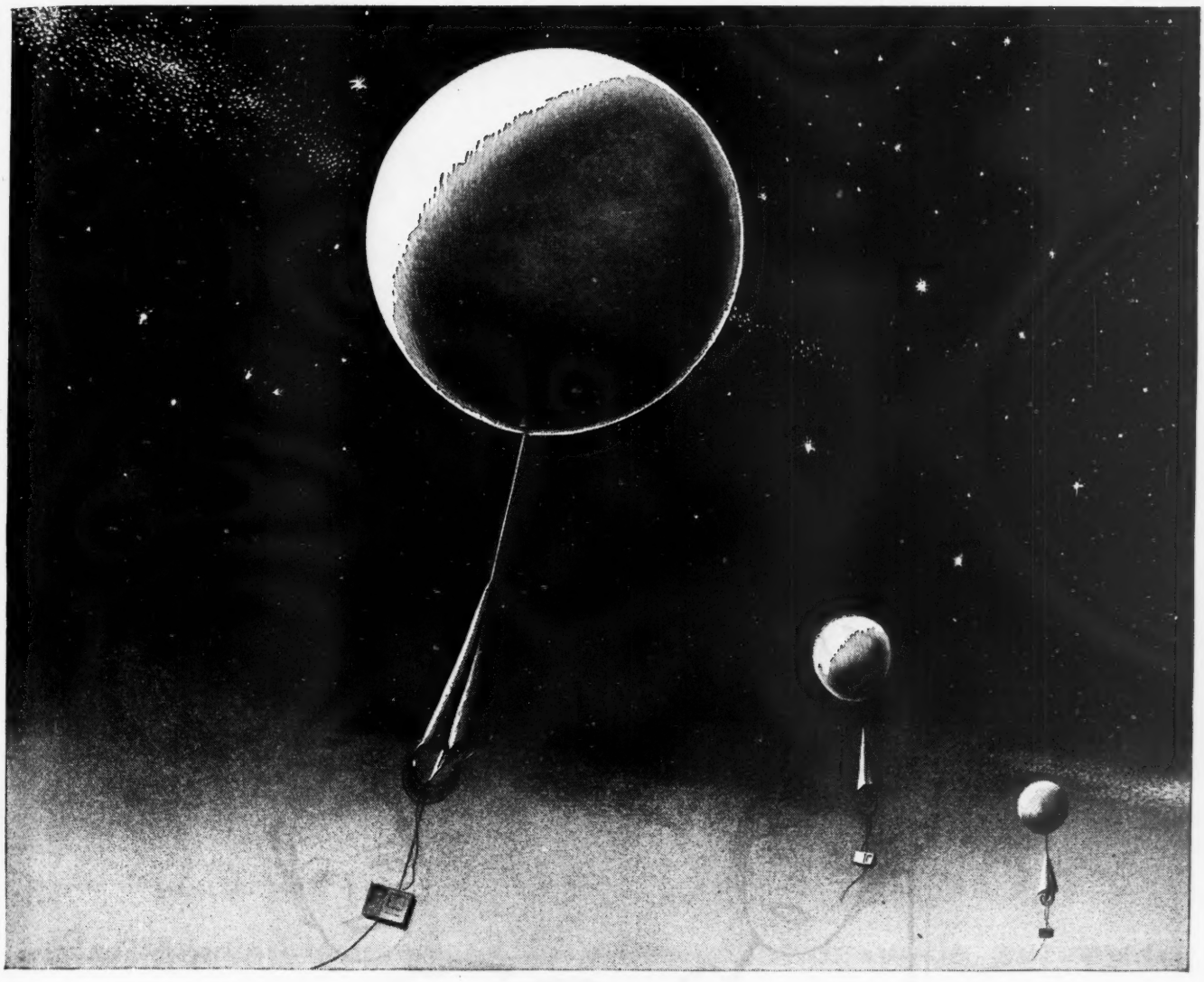
The most advanced metallurgical procedures are employed in the manufacture of Walworth Pipe Wrenches. Forging, heat-treating, and machining operations are performed with modern production equipment under strict supervision. In this way Walworth maintains the high standards of quality that have made Walworth pipe wrenches famous throughout the world.

WALWORTH

valves AND fittings

60 EAST 42nd ST., NEW YORK 17, N.Y.

BOSTON WORKS
KEWANEE WORKS



FARTHEST FRONTIER OF MANKIND

. . . 132,000 FEET UP

AT this very moment, men may be getting messages direct from the sky 25 miles above the earth's surface. Scores of "radio-sondes" make nightly balloon ascensions into the stratosphere. One reached the fantastic altitude of 132,000 feet!

The radio-sonde is a compact radio sounding unit, borne aloft by balloon and returning to earth by parachute. It contains delicate instruments for measuring temperature, pressure, humidity, other phenomena vital for weather forecasting. It contains, too, radio equipment for transmitting this information to receiving sets on the ground.

How would you test the radio-sonde under actual working conditions?

In test chambers, General Electric air conditioning and refrigeration equipment help reproduce the strange, unearthly "weather" of the mid-stratosphere . . . air of extremely low absolute humidity . . . with temperatures ranging down to —100° . . . air so thin it exerts a pressure less than 1/100 of the atmospheric pressure at sea level!

Creating stratosphere weather was another tough job, another exacting wartime problem for G-E engineers.

In solving many of these problems, we've made air conditioning and refrigeration equipment more compact, more flexible, more efficient—adaptable to the postwar requirements of *more users*. Investigate! Write: *General Electric Co., Air Conditioning and Commercial Refrigeration Divisions, Section 4412, Bloomfield, N. J.*

☆ **BUY . . . and hold . . . WAR BONDS** ☆

Air Conditioning by

GENERAL ELECTRIC

Hear the General Electric Radio Programs: The "G-E ALL-GIRL ORCHESTRA," Sundays, 10 p.m., EWT, NBC..." THE WORLD TODAY" News, Every Weekday, 6:45 p.m., EWT, CBS

Consumers COAST-TO-COAST Reveal

BIG ADVERTISEMENTS IN FULL COLOR
BOOST PUBLIC PREFERENCE FOR CANS

Every month more than 30,000,000 printed messages—full pages in full color—are reminding your consumers of the advantages of cans.

The convincing sales story of the steel-and-tin container reaches families throughout the nation through leading Sunday newspapers and the ten great national magazines shown here.

The American Home 2,363,796	Better Homes & Gardens 2,479,448		Good Housekeeping 2,690,373	Liberty 1,155,727
American 2,556,469	True Story 2,073,531	LOOK 1,919,130		
		Post 3,475,822	McCall's 3,535,700	Journal 4,136,747

NO OTHER CONTAINER

WHY THEY PREFER BUYING PACKAGED FOOD IN CANS

Here are the 5 MAJOR REASONS housewives gave in recent nation-wide survey

Cans are safer! They don't break, chip, split, leak, or tear.

Cans protect your health! Food in cans keeps better—and longer.

Cans protect product quality! They protect food from air and light—prevent discoloring and deterioration.

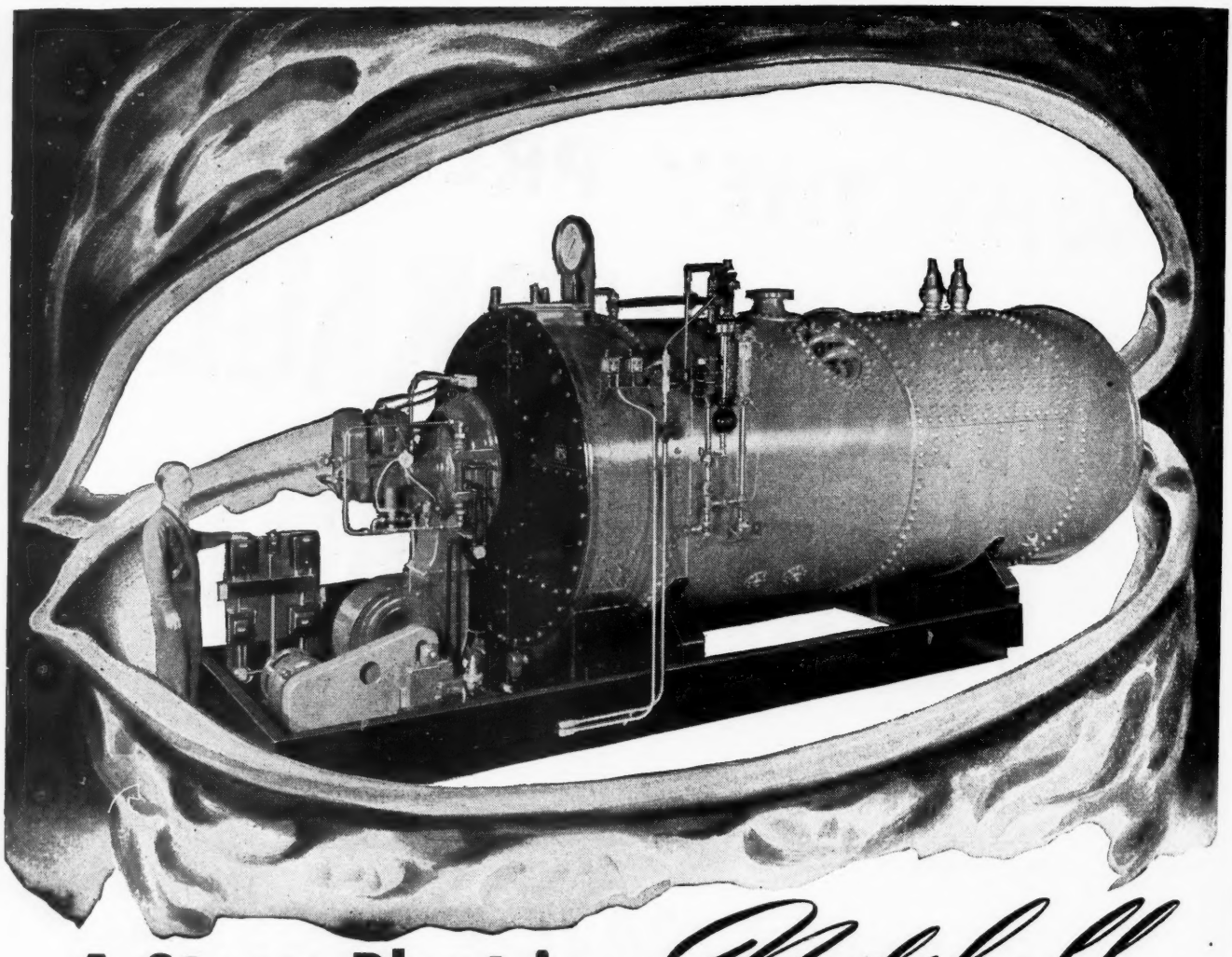
Cans are more convenient! They're easier to handle, to store, to open, to dispose of after use.

. . . And they're more economical! Cans are less expensive.

SO YOU, in planning your post-war packaging, can take advantage of these proved consumer preferences . . . and plan now to pack your product in that familiar, well-liked container, the steel-and-tin can!

CAN MANUFACTURERS' INSTITUTE, INC., NEW YORK

PROTECTS ***LIKE THE CAN***



A Steam Plant in a *Nutshell*

"THERE it is in a nutshell". . . the most compact means for generating steam for heat, power, or processing . . . the Cleaver-Brooks steam generator.

These self-contained steam units are shipped in complete "packaged" form ready to set down on the floor and connect to water, oil, and steam lines. Hundreds of American manufacturers have found it a simple, inexpensive job of installation requiring minimum floor space and room.

Cleanliness in operation is an outstanding feature of the Cleaver-Brooks steam generator. There is no ash, dirt, soot or smoke. The generator runs with almost no attention other than simple routine checking and maintenance.

It is no less astonishing that, in addition to all these advantages of a complete "packaged" unit with minimum space requirements and cleanliness of operation, the Cleaver-Brooks steam generator sets a new high in fuel economy.

The four-pass, fire tube design insures getting the last possible heat unit out of every ounce of fuel. (Thermal efficiency of better than 80% guaranteed.) Steam comes fast and in large volume for the size of the generator — flexible firing rate responds quickly to sudden steam demands assuring a steady pressure throughout the connected system.

In a nutshell, Cleaver-Brooks steam generators give low cost steam with the least demand on the plant operating force for installation, operation, or maintenance. Sizes run from 15 to 500 bhp., at steam pressures from 15 to 200 lbs. sq. in.

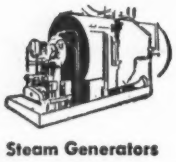
INSTANT STEAM — COST CALCULATOR

Write for this instant steam cost calculator. Yours for the asking. Figures steam costs for oil or coal.

CLEAVER-BROOKS COMPANY
5103 N. 33rd STREET MILWAUKEE 9, WIS.

Cleaver-Brooks
STEAM GENERATORS

CLEAVER-BROOKS PRODUCTS INCLUDE:



Steam Generators

Food Processing Equipment

Tank Car Heaters

Bituminous Boosters

Special Military Equipment

GAIR BY AIR

SAVES WEIGHT—SAVES SPACE
SAVES PACKAGING COSTS

To the land of the Totem Poles — flying time's from dawn to dusk. Because weight is a first consideration Gair containers and corrugated boxes play a vital part in overland and overseas shipping now and for the future. Gair by Air means maximum cargo at minimum tonnage. Write for bookler "Air Cargoes."

For large users—booklet on the Palletized Load, illustrated with official photographs.

SAVE WASTE PAPER FOR WAR PRODUCTION

ROBERT GAIR COMPANY, INC., NEW YORK • GAIR COMPANY CANADA LIMITED, TORONTO
Folding Cartons • Box Boards • Fibre and Corrugated Shipping Containers

WESTINGHOUSE PRESENTS JOHN CHARLES THOMAS • SUNDAY 2:30 EWT., N.B.C. ★ TED MALONE • MON., WED., FRI. 10:15 EWT., BLUE NETWORK

Tough coats for Electrodes...

LONG LIFE FOR LAMPS

Sealed in each end of a fluorescent lamp is a coil of finely drawn tungsten. These coils are coated with a special material which emits billions of electrons. The electrons bombard the mercury vapor . . . and also the coating on the coils.

How long and efficiently the coils will function depends on how well the coating withstands such bombardment.

Persistent Westinghouse research has developed an electronic emission coating of extraordinary efficiency. Not only does it supply a high quota of many billions of electrons per second, but it also is extremely tough, thus gaining capacity to stand up in service, giving hour after hour of efficient light.

And that is why, when you order fluorescent lamps, it pays to ask for Westinghouse. Your nearest Westinghouse dealer can now supply you. Westinghouse Electric & Manufacturing Co., Bloomfield, New Jersey.

HELP SHORTEN THE WAR . . . BUY MORE BONDS THAN BEFORE!

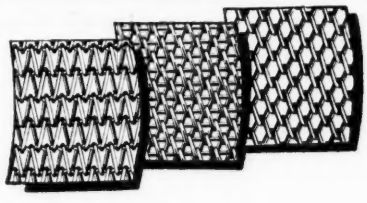
"Say J. B., he handles things almost as smoothly as our W. S. Conveyor Belts."

You can handle more Production—more Efficiently!

When Wickwire Spencer Flexible Metal Conveyor Belts are released for peacetime production, many new industries will want to take advantage of their cost-cutting benefits. For these highly efficient belts not only reduce handling costs—they speed production and insure more uniform results.

Wickwire Spencer Conveyor Belts are custom-engineered. They are built to give greatest load capacity per unit of weight; to operate efficiently at temperatures as low as —40° F. or as high as 2100° F.; to give long service under chemical action, extreme temperatures and other destructive forces. Belts can be fabricated in widths from 1" to 192"—in steels, brass, bronze, monel and various heat resistant alloys.

Write for our valuable reference book showing types and advantages of numerous conveyor belt constructions and weaves. Also pictures of many actual installations. Write to the Mechanical Specialties Division, General Sales Office and Plant, Sterling St., Clinton, Mass.



CONSIDER WEAVE

Prime consideration in drying and temperature applications is *free air circulation.* In washing *free drainage* is necessary. Wickwire Spencer Belts are available in several different weaves to suit specific needs.

WHERE THEY ARE USED

Annealing Ovens
Baking Ovens
Brazing Furnaces
Chemical Processing
Degreasing
Dehydrating Food
Canning Operations
Hardening Furnaces
Decorating Glass, Ceramics
Reclaiming Tin, Rubber, etc.

WICKWIRE SPENCER STEEL COMPANY

EXECUTIVE OFFICES—500 FIFTH AVENUE, NEW YORK 18, N. Y.

Abilene • Buffalo • Chattanooga • Chicago • Detroit • Houston • Los Angeles • Philadelphia • San Francisco • Tulsa • Worcester

TASTE-TEMPTER FROM TEXAS

Down in Dallas, Texas, the Southern States Foods, Inc., subsidiary of Standard Brands, Inc., makes a Sandwich Spread which, when combined with bread or crackers, is a real taste-tempting treat!

Called "Blue Bonnet" Sandwich Spread—because it is "made where the Blue Bonnets grow"—this wholesome food product is packed in sturdy glass jars with blue and yellow labels. The jars are sealed with Crown Screw Caps—attractively lithographed in blue and yellow to match the labels.

An exclusive feature of all Crown Screw Caps is the patented Deep Hook Thread—which enables glass packers to obtain the maximum amount of sealing pressure with the minimum amount of application force.

CROWN CLOSURES

CROWN CORK & SEAL COMPANY

Closure Division • *Baltimore-3, Md.*

WORLD'S LARGEST MAKERS OF METAL CLOSURES

You weren't supposed to see this, but . . .

Taylor Instrument Companies

INTER-OFFICE
CORRESPONDENCE

CITY Rochester, N. Y.

TO

DATE September 26, 1944

ATTENTION OF INDUSTRIAL SALESMEN

SUBJECT NOW IS THE TIME

We have just come through another hectic canning season full of good business, delivery headaches, emergency substitutions and irrepressible exasperations.

To you "field" men we owe thanks for the several orders placed well in advance of 1944 season requirements. However, we still have work ahead in convincing many customers that it pays to order more than a few weeks ahead of desired delivery dates. Therefore, may we now suggest that it is never too "early" to solicit canning business for the coming season. We don't mind accepting orders now for delivery next April, May and June. Furthermore, imagine the peace-of-mind available to canners who are willing to sit down with you now and discuss their anticipated instrument needs. It's good business and smart insurance for canners to have their instruments delivered a month or two before the season begins.

We believe you can help your canning customers do themselves some good if you will drive home the "ORDER NOW FOR '45" point. Don't let them get caught short like the unfortunate minority of 1944.

A. J. LINTZ
Industrial Sales Division

AJL:src

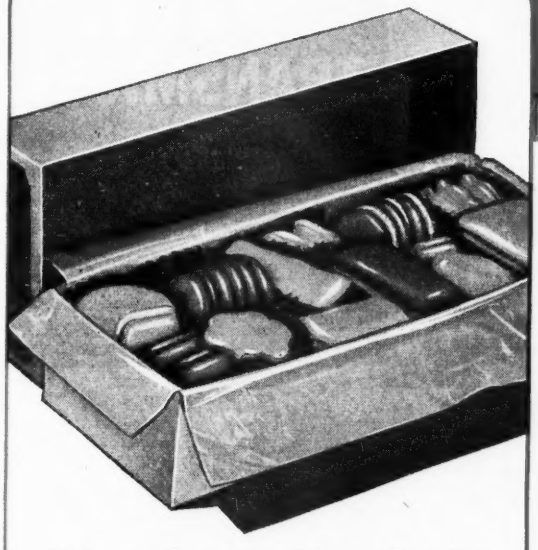
ARMY E NAVY

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

THIS was written as a confidential memo to our field men. But it says better than any mere "ad" what we'd like to say to *you* about getting your instrument orders in *early*. Last year we had a most difficult time meeting last-minute demands. Unfortunately, some of you were disappointed. We don't want that to happen again. That's why we are emphasizing that today is not a day too early to review next season's instrument requirements and place your order. Taylor Instrument Companies, Rochester, N.Y. and Toronto, Canada. *Instruments for indicating, recording, and controlling temperature, pressure, humidity, flow and liquid level.*

Here's why it pays food manufacturers to

Stay with Staley's for Soy Flour



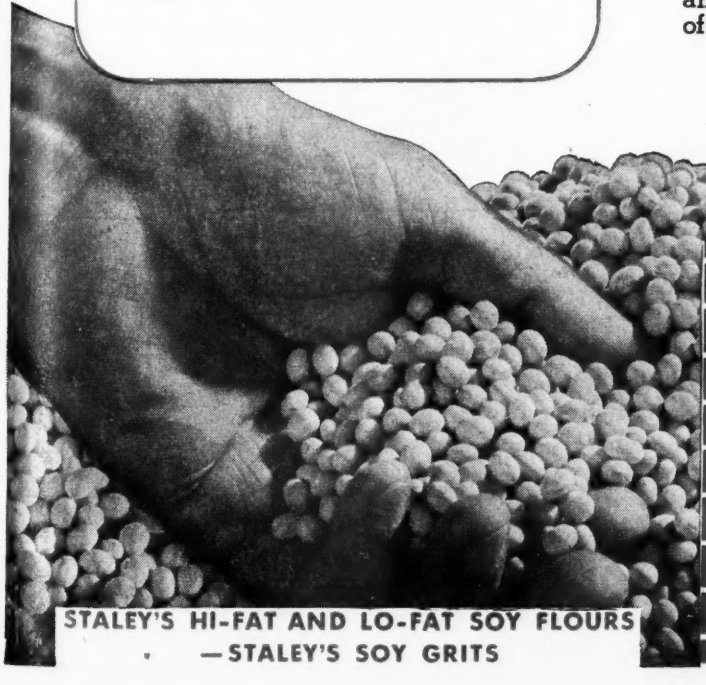
Modern soy flour is one of the world's richest and most economical sources of high-quality protein. It has a wide range of applications in the food field, improving the taste, color, texture, keeping quality and nutritional value of many different products. Investigate the opportunities it may offer you.

There are two reasons why the Staley organization is so well qualified to serve you. First, its 22 years of experience in the manufacture of soy bean products for the food trades. And second, Staley's continuous large-scale research, in field and laboratory, which furnishes accurate technical data on the most effective possible uses of soy flour.

Here are some of the special advantages that are enjoyed by present users of Staley's Soy Flour:

1. High nutritional values.
2. Bland flavor.
3. Light, attractive color.
4. Good emulsifying properties.
5. Fine, even granulation.
6. High-grade protein at low cost.

The coupon below will bring you some interesting and practical information regarding modern uses of soy flour. Fill it out and mail it in today.



STALEY'S HI-FAT AND LO-FAT SOY FLOURS
—STALEY'S SOY GRITS

Staley's
CORN AND SOY BEAN PRODUCTS

Industrial Sales Division
A. E. Staley Mfg. Co., Decatur, Ill.

Please send me complete data covering the uses of soy flour in the food industries, particularly in the manufacture of.....

NAME.....

FIRM.....

ADDRESS.....

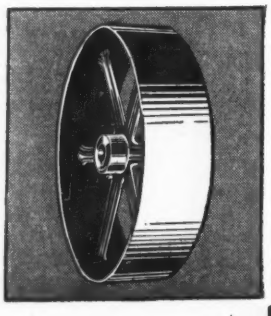
CITY.....STATE.....

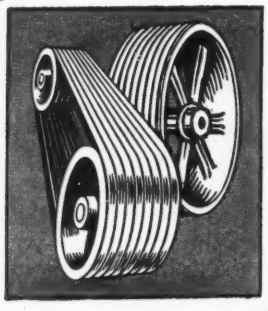
YOUR POST WAR PLANS

...Should Include...

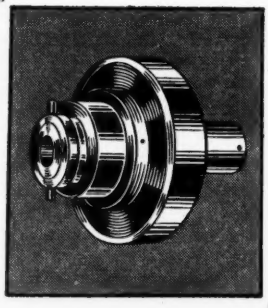
Wood's PLANNED POWER TRANSMISSION

The Wood's line of equipment for power transmission comprises bearings, collars, couplings, friction clutches, hangers, pillow blocks, pulleys and shafting for a variety of uses covering various industries, including cement mills, generators; paper mill, wood working and laundry machinery; compressors, mine fans, drill presses and for many other uses.





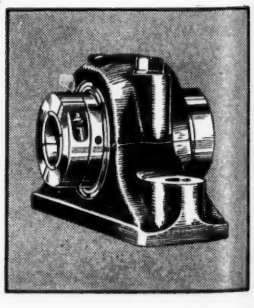
POWER... America's most vital War aid ...is her source of lasting Peace



Just as power produced the weapons with which America and her Allies are bringing certain defeat to the Axis, so will power enable us to forge the tools to build up what has been destroyed . . . to recreate the means of livelihood for a war torn world and to give employment to our returning soldiers.

Of utmost importance is getting power from its primary source to the driven machinery with minimum loss. This is a job that many plants have profitably given to Wood's Planned Power Transmission Equipment. It is a job that foresighted plants in future will intrust to Wood's Equipment and be assured of top performance, without unnecessary time-losing shut-downs and with minimum maintenance.

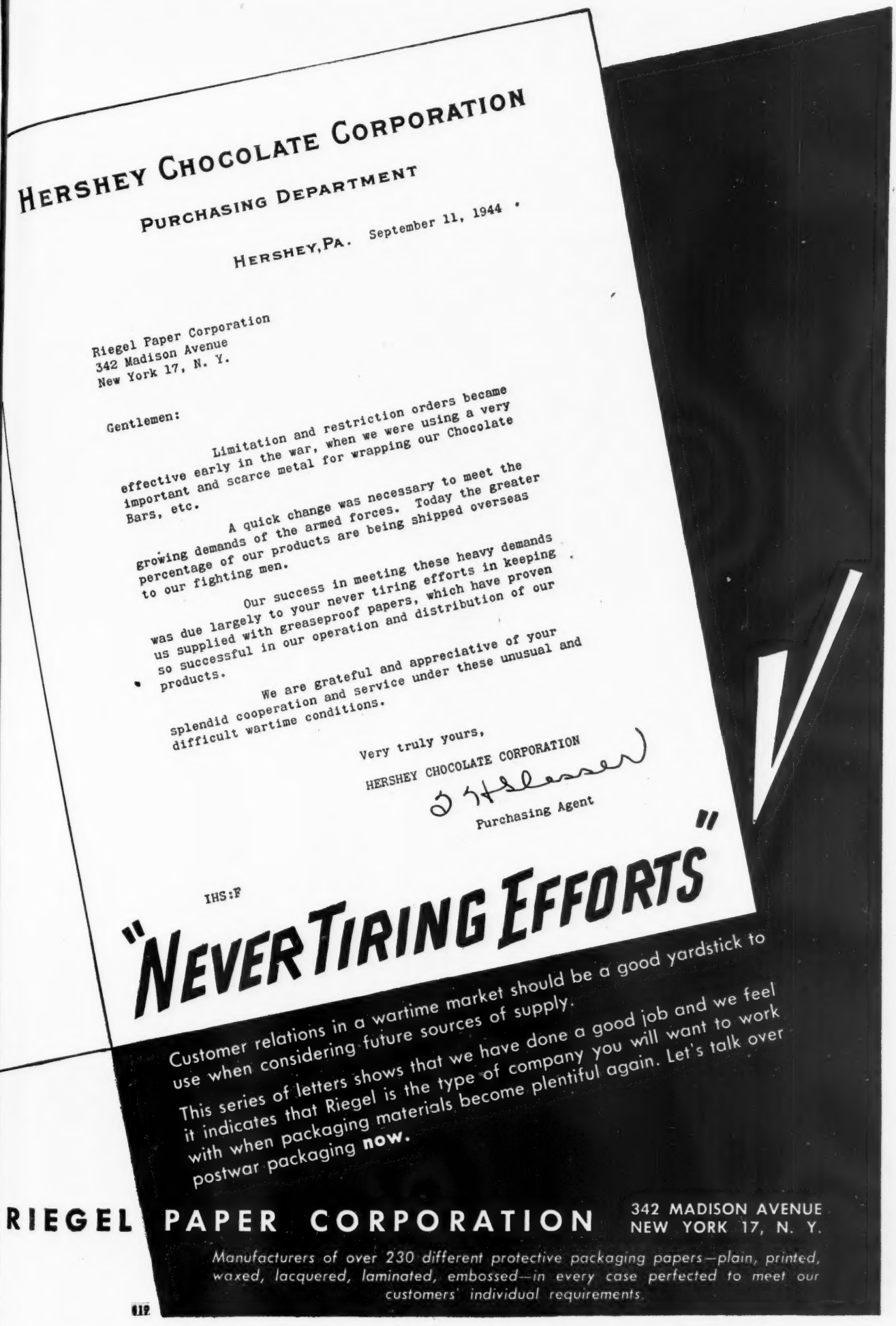
Through wars and eras of peace during 87 years of service to American industry, Wood's Products have earned a reputation for excellence. Into this complete line of transmission equipment has gone the engineering knowledge . . . the manufacturing skill, to insure efficient, trouble-free operation. We'll gladly supply more detailed information . . or consult one of the conveniently located Wood's distributors.



WOOD'S MODERN GROUP DRIVES...
DIRECT CONNECTED DRIVES...V-BELT DRIVES

T. B. WOOD'S SONS COMPANY, CHAMBERSBURG, PENNA.

BRANCHES: 387-391 ATLANTIC AVE., BOSTON, MASS. • 83 PLANE ST., NEWARK, N. J. • 425 FIRST AVE., PITTSBURGH, PA.



HERSHEY CHOCOLATE CORPORATION

PURCHASING DEPARTMENT

HERSHEY, PA. September 11, 1944

Riegel Paper Corporation
342 Madison Avenue
New York 17, N. Y.

Gentlemen:

Limitation and restriction orders became effective early in the war, when we were using a very important and scarce metal for wrapping our Chocolate Bars, etc.

A quick change was necessary to meet the growing demands of the armed forces. Today the greater percentage of our products are being shipped overseas to our fighting men.

Our success in meeting these heavy demands was due largely to your never tiring efforts in keeping us supplied with greaseproof papers, which have proven so successful in our operation and distribution of our products.

We are grateful and appreciative of your splendid cooperation and service under these unusual and difficult wartime conditions.

Very truly yours,

HERSHEY CHOCOLATE CORPORATION

D. H. Slesser

Purchasing Agent

IHS:F

"NEVER TIRING EFFORTS"

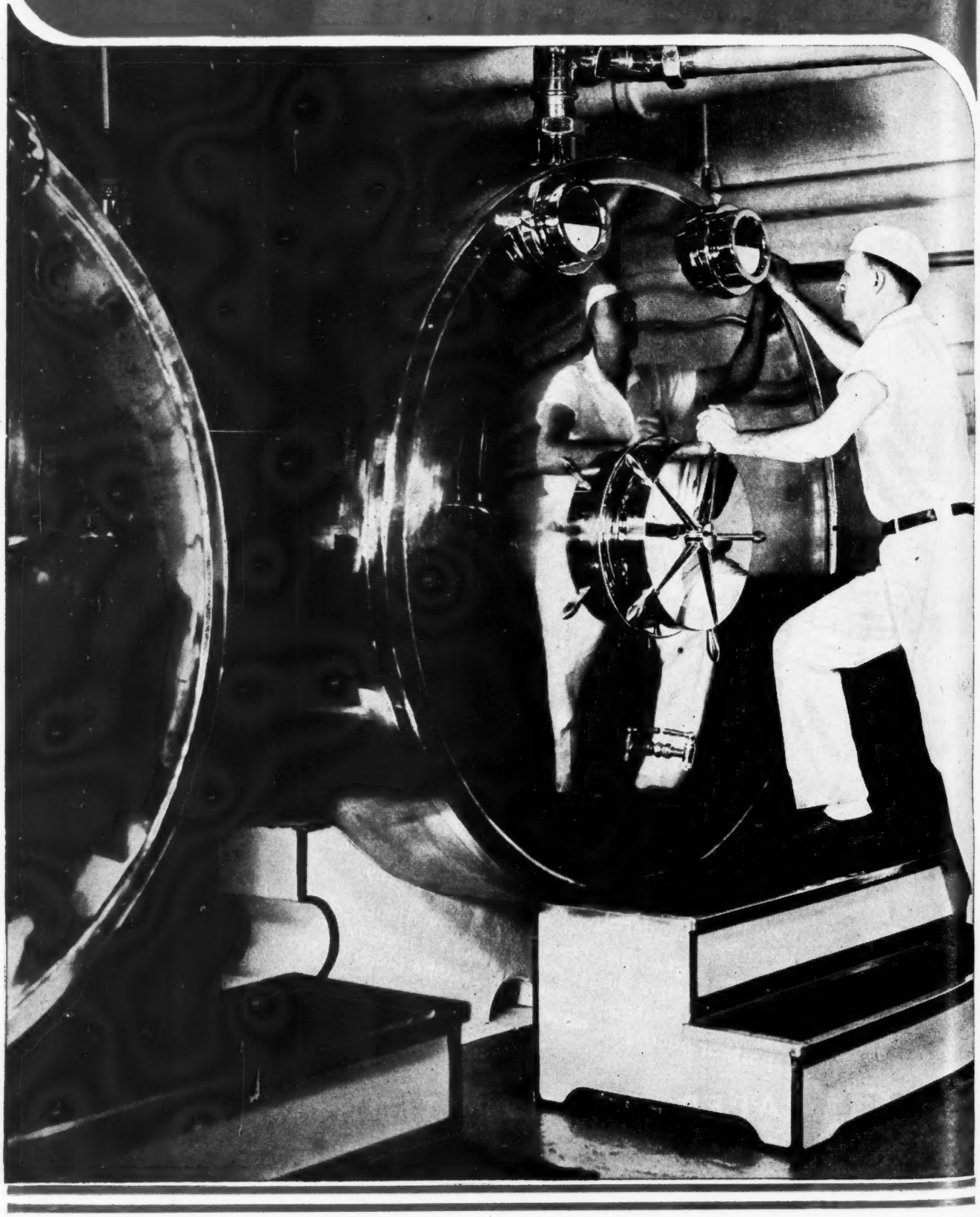
Customer relations in a wartime market should be a good yardstick to use when considering future sources of supply.

This series of letters shows that we have done a good job and we feel it indicates that Riegel is the type of company you will want to work with when packaging materials become plentiful again. Let's talk over postwar packaging **now.**

RIEGEL PAPER CORPORATION 342 MADISON AVENUE NEW YORK 17, N. Y.

Manufacturers of over 230 different protective packaging papers—plain, printed, waxed, lacquered, laminated, embossed—in every case perfected to meet our customers' individual requirements.

IN ONE MATERIAL—



THE STRENGTH OF STEEL —THE SANITATION AND EASY CLEANING OF GLASS

Here's a material with *ALL* of the qualities you need to cut equipment maintenance and replacement costs—to step up production—to safeguard product quality —Republic ENDURO Stainless Steel.

ENDURO ranks with the strongest of materials. It is tough and hard-surfaced. It resists wear and abuse. It retains its original lustrous surface indefinitely—because it's solid stainless throughout with nothing to wear off.

You can use ENDURO both at sub-zero and elevated temperatures with full assurance that it will retain its high strength as well as its other properties.

And ENDURO is just as sanitary and as easy to clean as glass. Its hard surface is free from pores which might carry contaminating substances from one batch to another. Usually a thorough flushing with water followed by wiping with a cloth restores its bright, clean surface. But when sticky or greasy substances must be removed, standard cleaning compounds may be used safely. Thus ENDURO saves time between batches and helps to increase production.

This metal of many advantages neither affects nor is affected by meats, vegetables, fruits or other food products. It will not rust or corrode. It will not affect color, flavor, body or purity of the most delicate food products.

The milk holder shown on the opposite page and the confectionery mixers on this page are good examples of where ENDURO is playing an important role today in food processing plants. We'd like to tell you about others—and how ENDURO can help you. Write us.

REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio

GENERAL OFFICES: CLEVELAND 1, OHIO

Berger Manufacturing Division • Culvert Division • Niles Steel Products Division
Steel and Tubes Division • Union Drawn Steel Division • Truscon Steel Company
Export Department: Chrysler Building, New York 17, New York

Republic

ENDURO STAINLESS STEEL

Reg. U. S. Pat. Off.

OTHER REPUBLIC PRODUCTS INCLUDE EX-L-ITE TIN PLATE—PIPE—SHEETS—UPSON BOLTS, NUTS AND RIVETS—ELECTRUNITE TUBING

Piping materials for any system ...CRANE supplies them all

ONE SOURCE OF SUPPLY...ONE RESPONSIBILITY FOR ALL MATERIALS

More helpful than ever, now that war deferred maintenance must be reckoned with, Crane *complete* piping materials service simplifies every step of piping rehabilitation. One reliable source—your Crane Branch or Wholesaler—supplies everything you need, be it a single fitting or a complete new system. In brass, iron and steel materials for all power and process piping applications, the Crane line provides the world's most comprehensive selections.

One order to Crane covers all your requirements for any job. One responsibility for the quality of all parts helps assure the best installation. But mainly, by always specifying Crane materials, you get full benefit of 89 years' experience and leadership in meeting industry's piping needs.

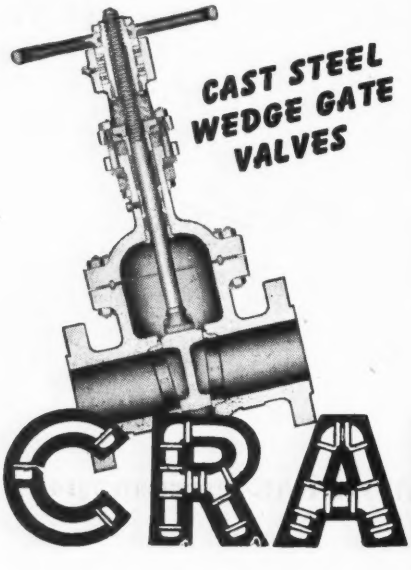
Crane Co., 836 S. Michigan Avenue, Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

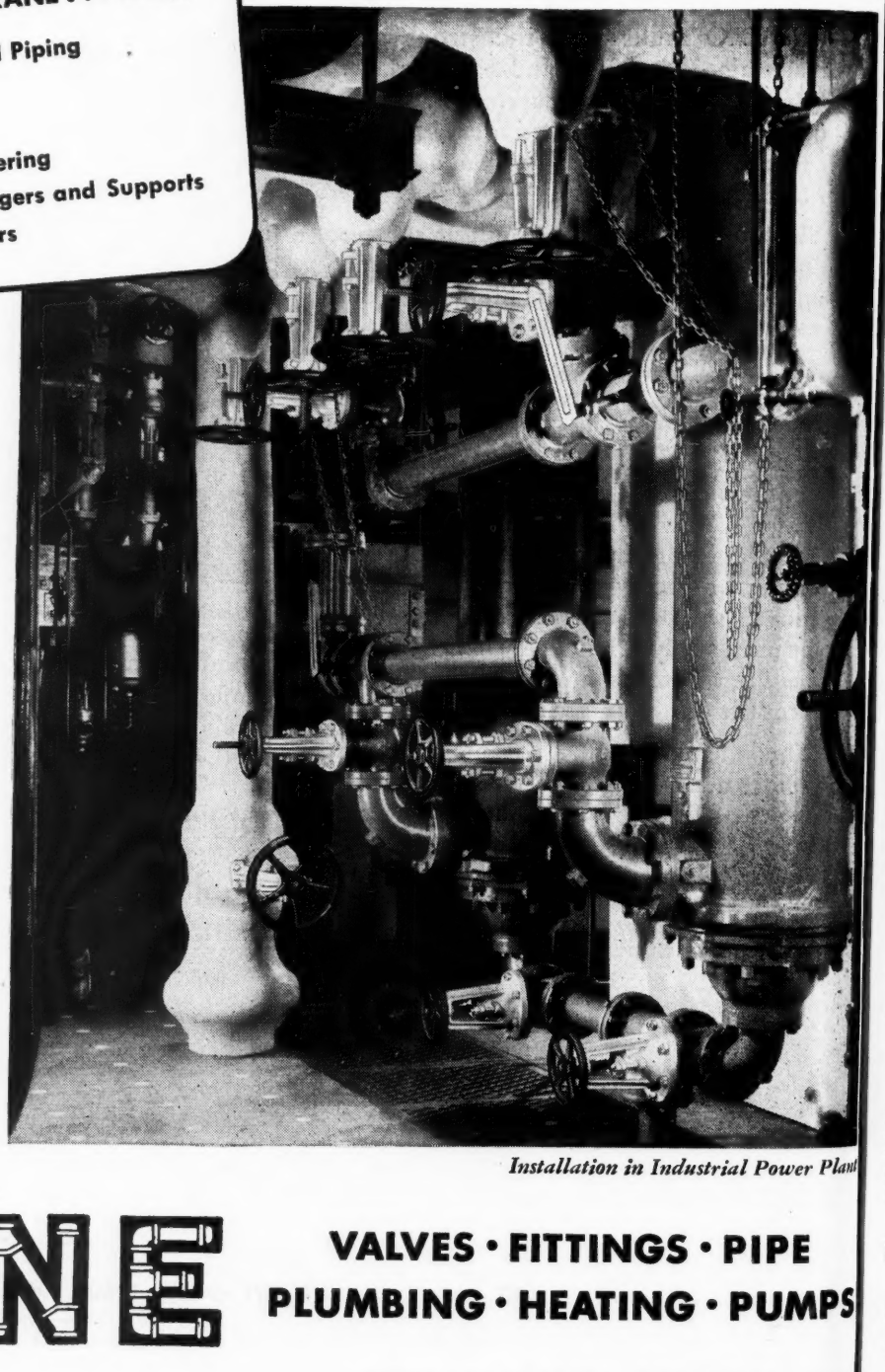
PIPING EQUIPMENT BY CRANE...100%

- Gate Valves
- Globe Valves
- Check Valves
- Screwed Fittings
- Flanged Fittings
- Pipe
- Fabricated Piping
- Unions
- Flanges
- Pipe Covering
- Pipe Hangers and Supports
- Separators

ONE STANDARD OF QUALITY

The same high quality protects every part of piping systems when Crane materials are used throughout. In Crane Steel Gate Valves, for example, straight-through ports permit unrestricted flow. Severest line stresses are overcome by sound and rugged body castings. Smooth operation is maintained by a ball joint type stuffing gland, strong tee-head disc-stem connection, and ample stem bearings. Positive seating is assured by extra long disc guide ribs.





Installation in Industrial Power Plant

CRANE

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

The can that carries "sunshine" to England will bring you the juice of 19 oranges!

● Our British allies were crucially in need of liquid "sunshine" — the health-giving Vitamin C of oranges. Problem: how to ship enough oranges or canned orange juice in vessels cramped for space.

The answer? Orange concentrate. A single carload of this amazing new concentrate in cans equals 30 carloads of oranges!

Today it's helping to boost Britain's health *above* peacetime levels. Tomorrow it will bring Vitamin C to millions who don't want the fuss or muss of squeezing fresh fruit. And one little 6-oz. can will hold the juice of 19 oranges!

A new process de-waters the fruit and reduces the bulk to ⅛th of the former volume, leaving a syrup. All you do is add 7 parts water, mix, and presto—orange juice!

Soon you'll get this new product—along with all the other fine fruit juices you get in cans today. And it will come in cans—because cans *protect* and *preserve*.

To do our war job we've developed new ideas and new skills, too. That's why as we look ahead we see *new and better things in Continental cans.*

ATTENTION, BUSINESSMEN:—We'll be glad to discuss present and future uses or improvements of your product or package. Write Dept. A., 100 East 42nd Street, New York 17, N. Y., or Continental Can Company of Canada, Limited, Sun Life Bldg., Montreal.

CONTINENTAL CAN COMPANY

NEW AND BETTER THINGS IN CONTINENTAL CANS

Awarded to Plant 78, Chicago • Illinois

ARMY E NAVY

SAVE TIN AND HELP CAN THE AXIS

The Howell Protected Type Motor, shown, gives complete protection against dripping liquids, metal chips and other falling particles. Completely streamlined—utilizing non-breakable steel frame—malleable or steel base—cast iron end plates and cast iron, weatherproof terminal box are standard construction features. Special horizontal and vertical mountings are available.

Available in sizes 5 H.P. and smaller.

The tens of thousands of owners who already have Howell Motors are "walking on air." Producers do like quality.

But, we all know the entire electric motor industry is confronted with a serious situation today. Demands for motors are up. Manpower is short. Materials are scarce.

While we are swamped with orders for Howell Motors, we have flatly refused to skimp on quality in order to speed production. However, we fully recognize our obligation to put forth the maximum effort in serving our customers NOW! This, we are doing.

Buy Horsepower by

HOWELL ELECTRIC MOTORS COMPANY

HOWELL, MICHIGAN

Manufacturers of Quality Motors Since 1915

Not quite this simple —

FOR FOLDING CARTON BUYERS WHO DELAY THEIR POSTWAR PACKAGE PLANNING

IT would be fine . . . if you could wait until the last minute . . . press a button . . . and, next morning, have your product, in its new postwar package, on shelves and counters all over the country.

But you know that it takes time to develop and perfect the package that's going to give your product a competitive advantage. And you know that the right time to begin is now—before Gardner-Richardson specialists are snowed under.

Right now's the time to get started on restyling, redesigning. Now's the time to look into more economical set-up and assembly, more efficient folding and sealing . . . better usage qualities, better production.

Press a button, call in your secretary . . . get off a letter today telling us *your* problem. Right now, it will get the kind of action we *like* to give.

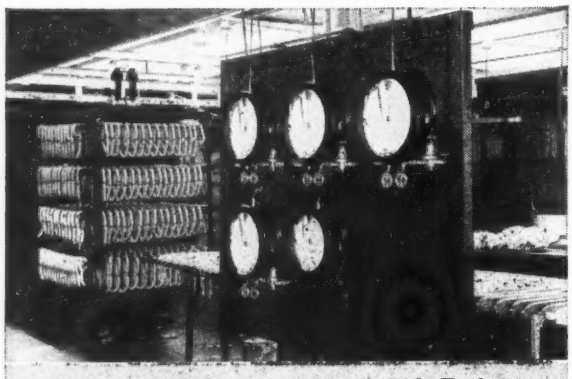
GARDNER-RICHARDSON EXPERIENCE and "know-how" have produced many new and revolutionary developments in folding cartons in the past few years. While, at present, our production is completely sold up, our creative and technical staffs are ready to put their skill, experience and new approaches to work on your postwar package problems.

The GARDNER-RICHARDSON Co.

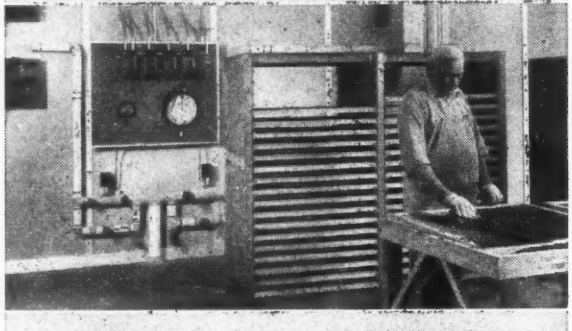
Manufacturers of Folding Cartons and Boxboard, MIDDLETOWN, OHIO

Sales Representatives in Principal Cities: PHILADELPHIA • CLEVELAND • CHICAGO • ST. LOUIS • NEW YORK • BOSTON • PITTSBURGH • DETROIT

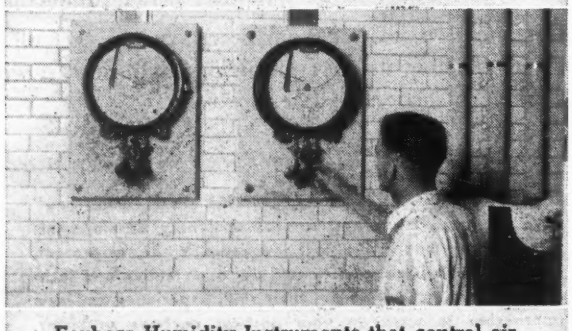
ENGINEERING KNOW-HOW THAT "Puts the Calipers" ON HUMIDITY!



Modern smokehouse equipped with Foxboro Temperature-Humidity Control.



Recent installation of Foxboro Humidity Control on vegetable dehydration unit.



Foxboro Humidity Instruments that control air conditioning in a large bakery.

IN many food processes, humidity can be the trickiest, most changeable factor . . . and the hardest to keep your finger on. But not if you have let Foxboro "put the caliper" on humidity by engineering automatic measurement or control installations to fit your individual requirements!

Foxboro's "know how" of humidity problems comes from more than a quarter century of original research and development in all types of humidity instrumentation. Foxboro engineers developed the *first* instrument to control both wet and dry bulb temperatures. They introduced controlled humidity in fruit drying . . . and have been consistent leaders in applying instrumentation to other industrial uses such as air conditioning, dryers, smokehouses and dehydration units.

Get the benefit of this superior "know how" in your humidity processes by specifying Foxboro. Write for detailed Bulletin **188-4. The Foxboro Company, 30 Neponset Ave., Foxboro, Mass., U. S. A.**

Branches in principal cities.

FOXBORO REG. U. S. PAT. OFF. **HUMIDITY CONTROL**

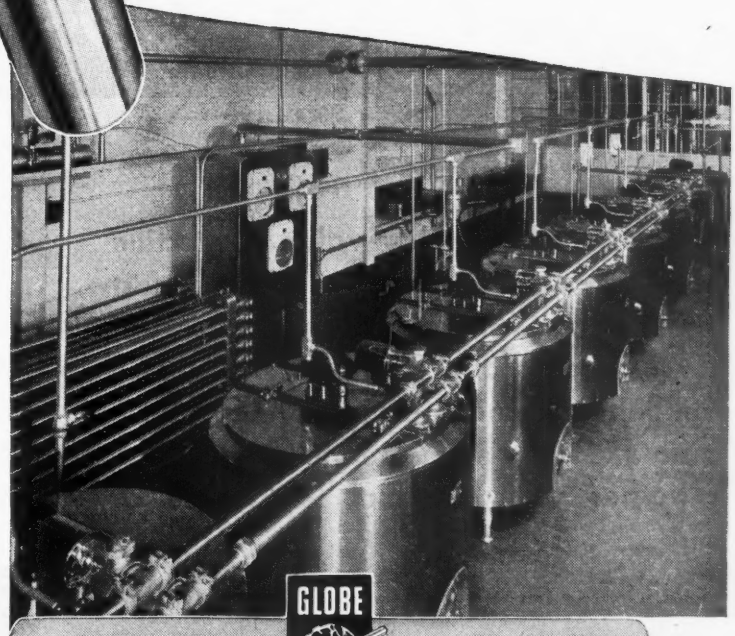
Clean, sterile conditions are absolutely essential where food, dairy and chemical products are processed. This includes the tubes through which the substance must pass or with which it comes in contact. Nothing less than satin-smooth, noncontaminating tubes will answer the purpose

GLOBE STAINLESS *Steel Tubes*

Big users of Globe Stainless Steel Tubes are the chemical, food, dairy, and other process industries. In the vital arteries of processing, the extra margin of safety provided by these tubes is essential.

Whatever your tubing problems may be, let Globe help you with them. GLOBE engineering staff, excellent laboratory facilities and production capacity can provide you with the tubes exactly suited to your needs.

3006



★ STAINLESS TUBES
★ BOILER TUBES
★ GLOBEIRON TUBING
★ GLOWELD TUBES

GLOBE TUBES

★ CONDENSER AND HEAT EXCHANGER TUBES
★ MECHANICAL TUBING

GLOBE STEEL TUBES CO., *Milwaukee 4, Wis., U. S. A.*

PACKAGES by MILPRINT

means BETTER *design* BETTER *protection*

Attention and display value, protection and convenience . . . these are the most vital factors which make for a successful consumer package. And with the intense competitive conditions just ahead, those factors assume even greater significance. Whether your product is Cheese or Cosmetics, Hosiery or Apple Pie, this organization has the know-how and resources to provide you with the kind of packages that can stand up to the toughest postwar competition. Those are the kind of packages you will need. Why not write and consult us today?

PLANTS AT · MILWAUKEE · PHILADELPHIA
LOS ANGELES ★ SALES OFFICES IN · NEW YORK · CHICAGO · PHILADELPHIA
SAN FRANCISCO · BOSTON · ST. LOUIS

MILPRINT Inc.
PACKAGING CONVERTERS ★ PRINTERS ★ LITHOGRAPHERS

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CLEVELAND · CINCINNATI · MINNEAPOLIS
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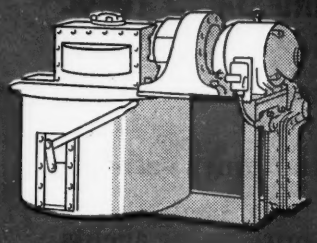
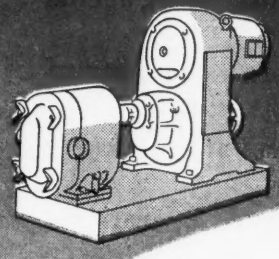
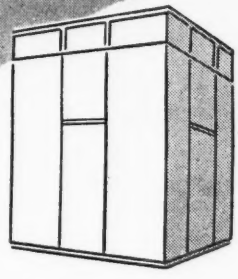
GRAND RAPIDS

SPECIALISTS IN DISPLAY PACKAGE DESIGN AND DEVELOPMENT

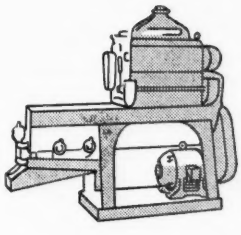
Where There Is Danger of Splashing Liquids



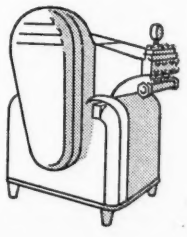




Get the Protection of CENTURY SPLASH PROOF MOTORS!

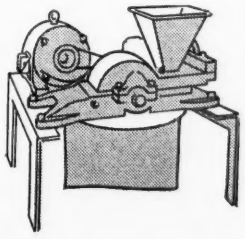


There's a Century Splash Proof motor for every application in food processing, beverage, baking, brewing, and dairy plants—such as mixers, pumps, washers, grinders, presses, homogenizers, crushers, pulverizers, etc.



Century Splash Proof motors give protection from falling or splashing liquid, whether on indoor or outdoor installation—also wherever plants are washed down.

It may pay you to get complete details on all the advantages of Century Splash Proof motors for food processing plants. Call in a Century engineer today.



Century C MOTORS

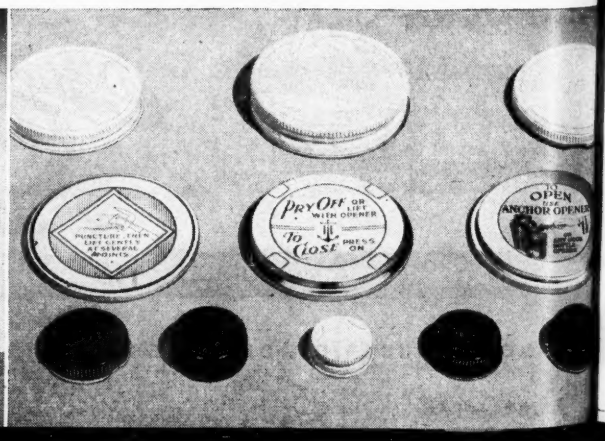
CENTURY ELECTRIC COMPANY
1806 Pine Street, St. Louis 3, Missouri
Offices and Stock Points in Principal Cities

388

THE ANCHOR HOCKING GLASS PACKAGE COMPLETELY RECONCILES ALL THE DIVERSE DEMANDS OF EXECUTIVES, DEPARTMENT HEADS AND SALES FORCE

Policy executives want a package which protects products from deterioration, spoilage and loss of virtues until consumed, thus assuring consumer satisfaction and eliminating complaints and returns. Treasurers and purchasing agents are interested in initial and production costs, and in the long-run economy of having the best package for the job. Production heads demand packages accurate in capacity and finish, resistant to shocks of high-speed operations, and economical on labor costs through ease and speed of handling. They also prefer a supplier able and willing to render expert technical and research assistance when needed. Sales and advertising men want a package that enhances the attractiveness of the product, stimulates product recognition and acceptance, and meets the consumer's preference for easy opening and resealing.

From all these points of view, an Anchor Hocking glass container—sealed with the correct type of Anchor metal or plastic cap for an airtight or vacuum seal—forms the ideal package for your products.



WILL THE GLASS PACKAGE YOU RECOMMEND SATISFY THE DIVERSE REQUIREMENTS OF THIS GROUP, MR. HIGBEE?
FROM ALL POINTS OF VIEW, ANCHOR HOCKING GLASS PACKAGES SATISFY

A. V. HIGBEE, one of Anchor Hocking's ablest and most popular men, has been a member of the Anchor Hocking family for 25 years.

"Meet Corliss Archer" every Thursday evening, entire coast-to-coast network CBS.

ANCHOR HOCKING

GLASS & CAPS

ANCHOR HOCKING GLASS CORPORATION • LANCASTER, OHIO

REDUCE YOUR

"Down Time"

by installing this

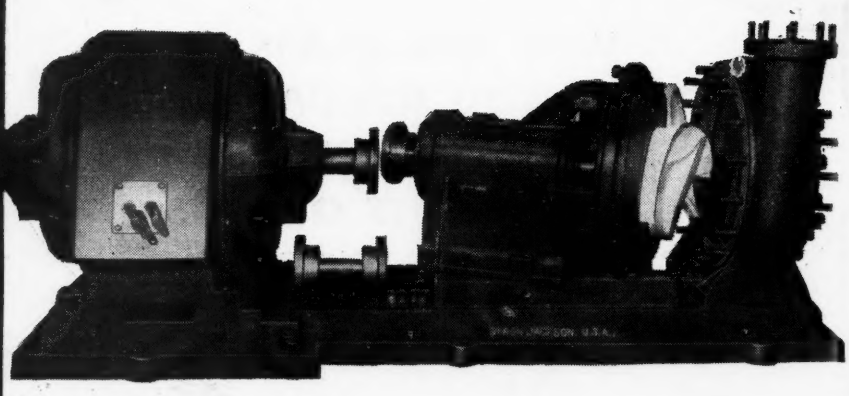
BYRON JACKSON

PULP PUMP

★ IT IS
HUSKY AND RELIABLE

★ IT HAS
NO TONGUE AND GROOVE
MOUNTINGS

★ AND LINERS
ARE EASILY RENEWABLE



This simple, rugged, easily dismantled pump is proving that the handling of fruit, grain and vegetable pulp, of both high and low consistency, can be accomplished with minimum "down time"—plant throughput can be increased and maintenance costs decreased.

An unusually large suction eye keeps velocities low, and the possibility of vapor binding is minimized.

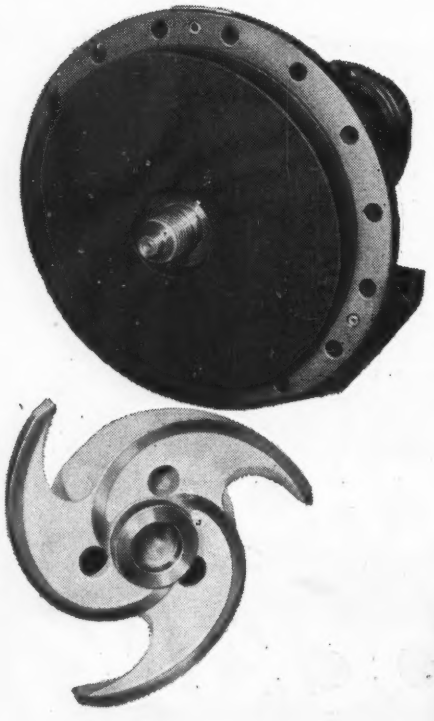
Complete bracket assembly with rotating element, pump cover and liners, can be removed as an assembled unit without disturbing the driver or the pump suction or discharge piping.

Renewable liners—of hardened iron or steel—securely bolted to the pump case covers—can be easily replaced, thereby eliminating the difficult-to-maintain tongue and groove mounting.

Impeller is of open type, mounted on an extra large heat treated shaft with coarse, self-tightening Acme threads.

Stocks with high acid or alkaline content are handled by special materials suited for the specific job.

Write today for further information.



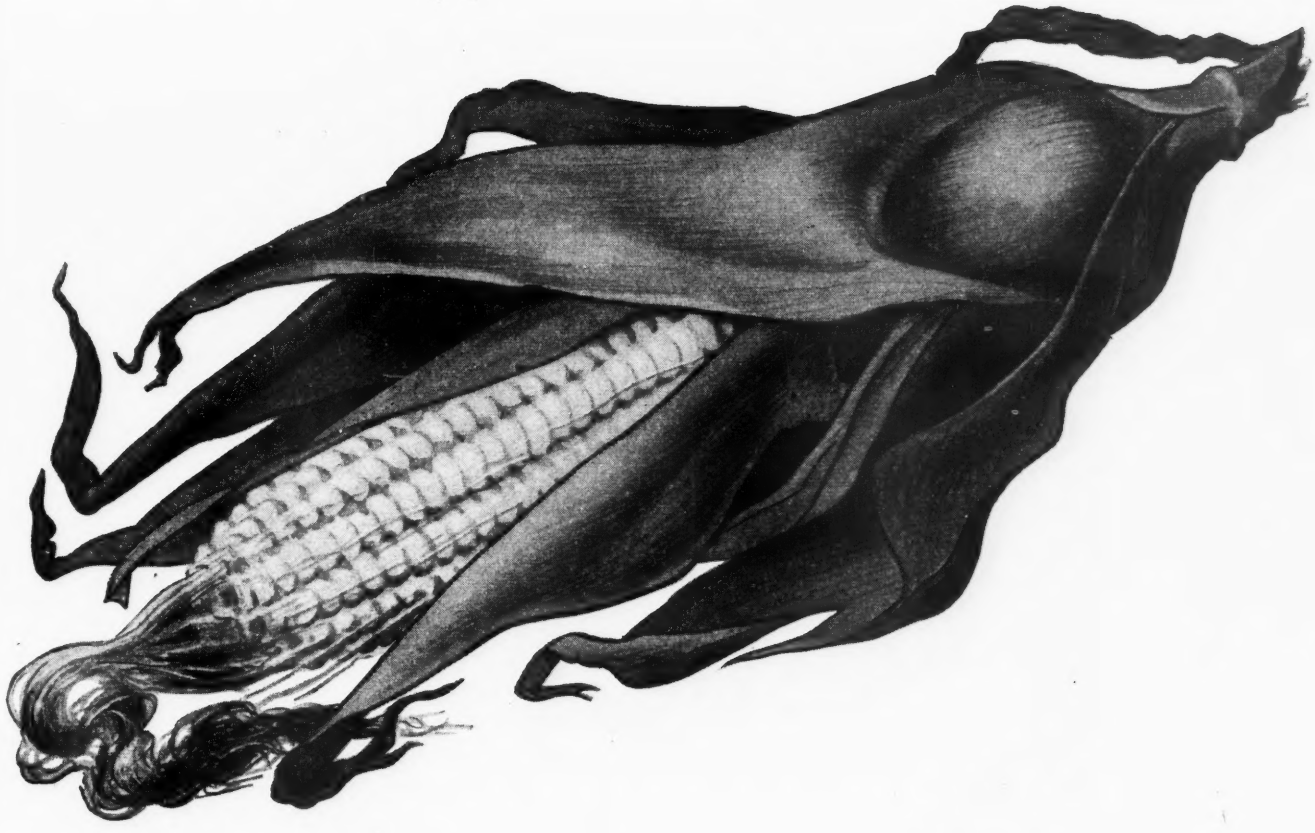
Close-up of liner as bolted to pump case cover and detail of impeller mounted with self-tightening Acme threads.

ARMY E NAVY

BYRON JACKSON CO.

Houston • LOS ANGELES • New York

AN AMERICAN INSTITUTION WORKING WITH AND FOR AMERICA



PACKAGING by Nature

Wise Old Mother Nature taught man the first lessons in protective packaging. Encased in their shrouding armor of skin, husk, pod, rind or shell, all growing edibles fend off the enemies of fruition from *without* while conserving *within* their precious nourishment. Because today's pattern of food consumption demands many forms of processing, distribution and storage, the essential factor of preservation recurs and man-made protective packaging becomes all important. Now-a-days, many foods in many forms possess finer freshness, improved taste, enhanced appearance and unimpaired nutritional values because of being safeguarded in Rhinelander Protective Papers. Unrelenting research and development of improved techniques added to the skills achieved over nearly a half-century are the bedrock upon which Rhinelander's reputation was gained and will ever be maintained.

FROM THE BEST THAT'S MADE
RHINELANDER
PROTECTIVE PACKAGING
Papers
TO THE CHEAPEST THAT'S GOOD

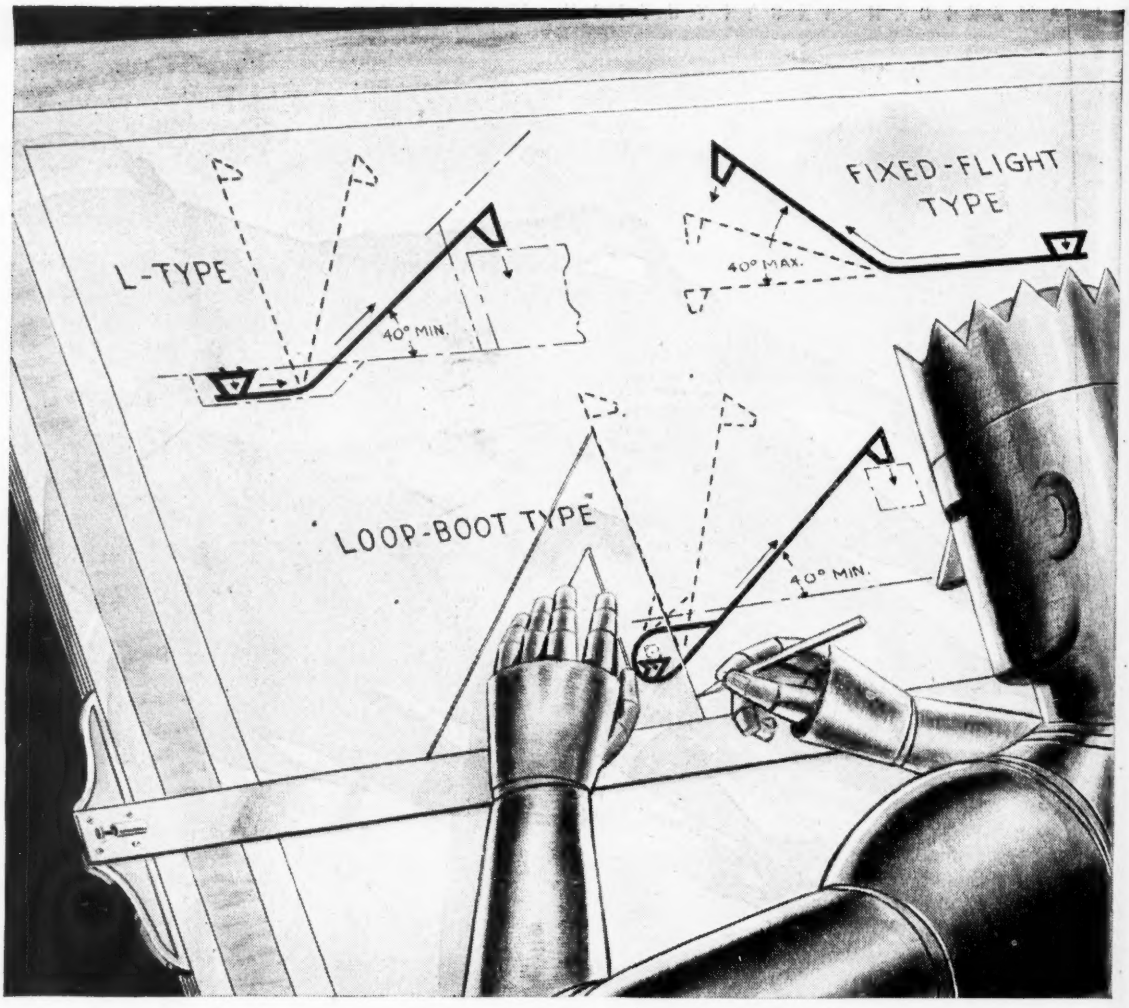
Genuine Greaseproof
Coffee Bag Papers
Confectionery Papers

Cereal Wrapping Papers
Laminated Greaseproof Papers
Lard and Shortening Liners

Bakery Product Wraps
Cracker Box Liners
Greaseproof Innerwraps

Wax Laminated Glassine
Opaque Label & Bag Glassine
Packing Industry Wrappings

RHINELANDER PAPER COMPANY • MILLS AT RHINELANDER, WISCONSIN, U.S.A.



REX C. E. Announces His NEW UNI-FLO

For the Bulk Handling of Dry Food Products

A NEW efficient, economical method of handling free-flowing bulk materials . . . a "pipe line" conveyor system that transports grain, cereals, seeds, flours, meals, and similar food products in a continuous uniform flow . . . that's the new Uni-Flo, developed by Rex Conveying Engineering —Rex C. E.

In designing the Uni-Flo, Rex C. E. incorporated every feature that would increase its economy and efficiency. Uni-Flo provides positive capacity; the discharging rate does not depend on continuous loading. It is self-cleaning, and material is carried with a minimum of churning and degradation. Uni-Flo is self-feeding—requires no auxiliary feeding devices. And, because it is completely enclosed, it is dust-free and clean. Material is carried in a solid column without any waste space, thus saving valuable space.

There are no pockets in the Rex Uni-Flo to reduce capacity and efficiency. Discharge is positive, does not depend on gravity. And the slow operating speed of Uni-Flo means longer life . . . freedom from maintenance worries.

Rex C. E. and his staff of experienced conveying engineers will be glad to help you select and install Uni-Flo for your plant. For information, write for your copy of Bulletin No. 442. Address Chain Belt Company, 1616 West Bruce Street, Milwaukee 4, Wisconsin.

REX **UNI-FLO CONVEYORS**

CHAIN BELT COMPANY *OF MILWAUKEE*

BOTTLES OF
Quality and Character
FOSTER FORBES Glass Company
MARION, INDIANA, U. S. A.
SALES REPRESENTATIVES
KANSAS CITY
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ST. LOUIS
HAVANA, CUBA
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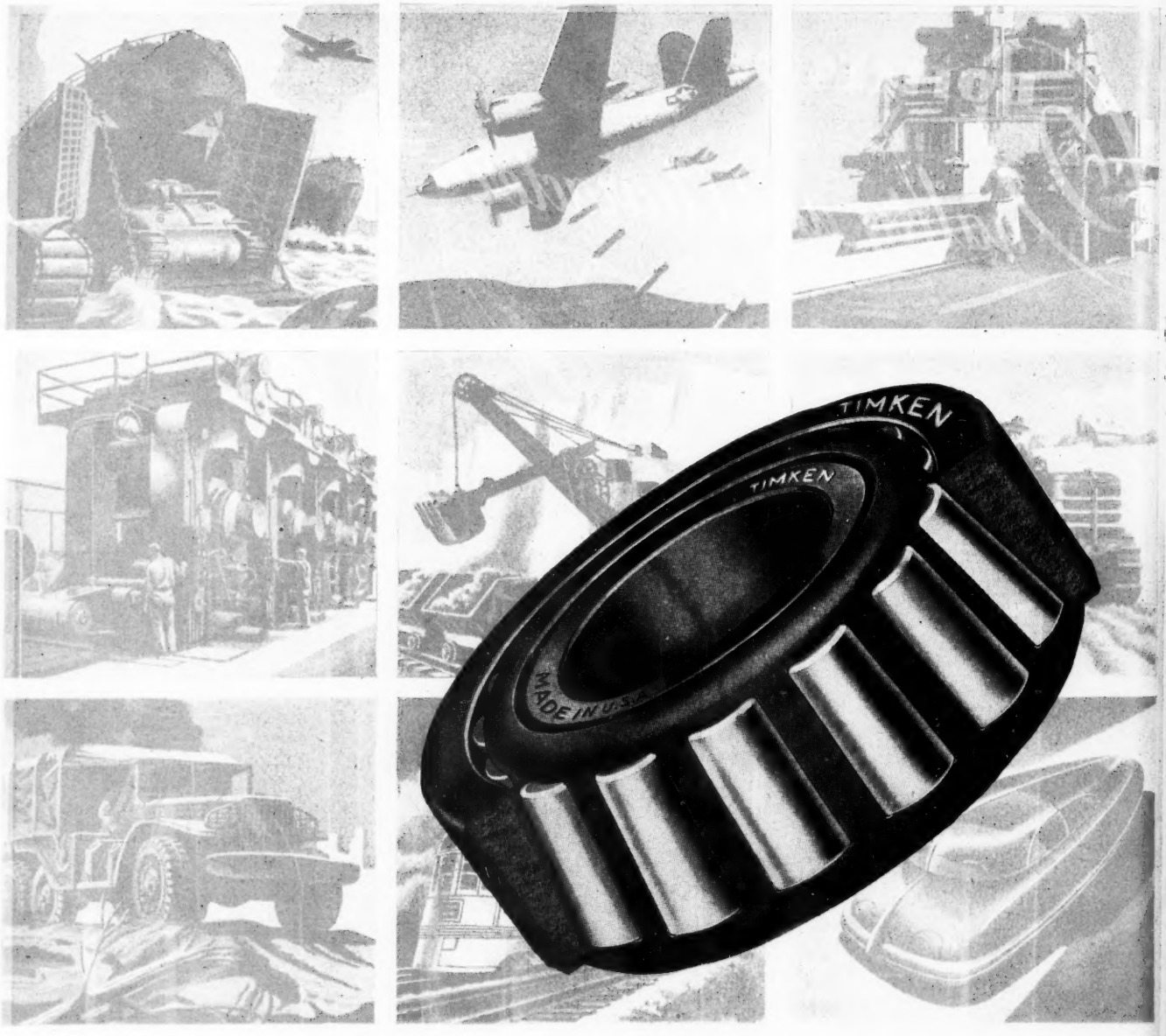


Leadership Throughout Industry

In every branch of Industry, executives see that machinery they use or make is Timken Bearing Equipped.

This practice has become so standard that in numerous cases it is just a routine matter. When bearings are needed, Timken Tapered Roller Bearings are specified.

Management knows the matchless record of this product—accepted everywhere as the bearing that delivers sustained, dependable performance. Timken Bearings are used in countless types of war material, automobiles, trucks, tractors, locomotives, streamlined trains and industrial machinery generally.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

Design, research and experience are the reasons you can trust Timken Roller Bearings no matter how rough and rugged the going.

Your choice of bearings must be selective because the life and operating efficiency of any machine are vitally influenced by the quality of its bearing equipment. The Timken Roller Bearing Company, Canton 6, Ohio.

ILLINOIS PORCELAIN PIPE LINES *for handling INGREDIENT WATER*

★ QUALITY CONTROL

Through use of porcelain pipe you can avoid changes occurring in water composition during its handling in the plant. Because porcelain is non-metallic, water can't pick up metals or mineral materials. Among the advantages of this protective factor are . . . no increase in ash content of the finished product . . . rancidity of the fat content of finished product is not encouraged . . . discoloration or darkness during cooking is avoided . . . and in some instances loss of vitamin content is lessened.

★ PRODUCTION COST SAVINGS

The installation of porcelain pipe cuts maintenance through elimination of corrosion. Spoilage in materials is reduced, saving product losses. "Housekeeping" expense occasioned by dripping of water of condensation from exposed pipes is greatly lessened. The need for replacements is eliminated.

★ IMPROVED SANITATION

Wet spots in the plant produced by water of condensation do not occur when porcelain pipe is used. Since there is no pitting due to corrosion there are no rough spots in inside walls of porcelain pipe to accumulate or promote the growth of micro-organisms. Resistance to acid or alkaline waste eliminates breaks or leaks in waste disposal lines that may occur where there is corrosion.

★ TOTAL COST IS REDUCED

Porcelain pipe installations are permanent and therefore the first cost is the only cost. These installations may be built into the walls of the plant the same as are electrical conduits. This means that the possibility of damage from bumps or impacts is eliminated.

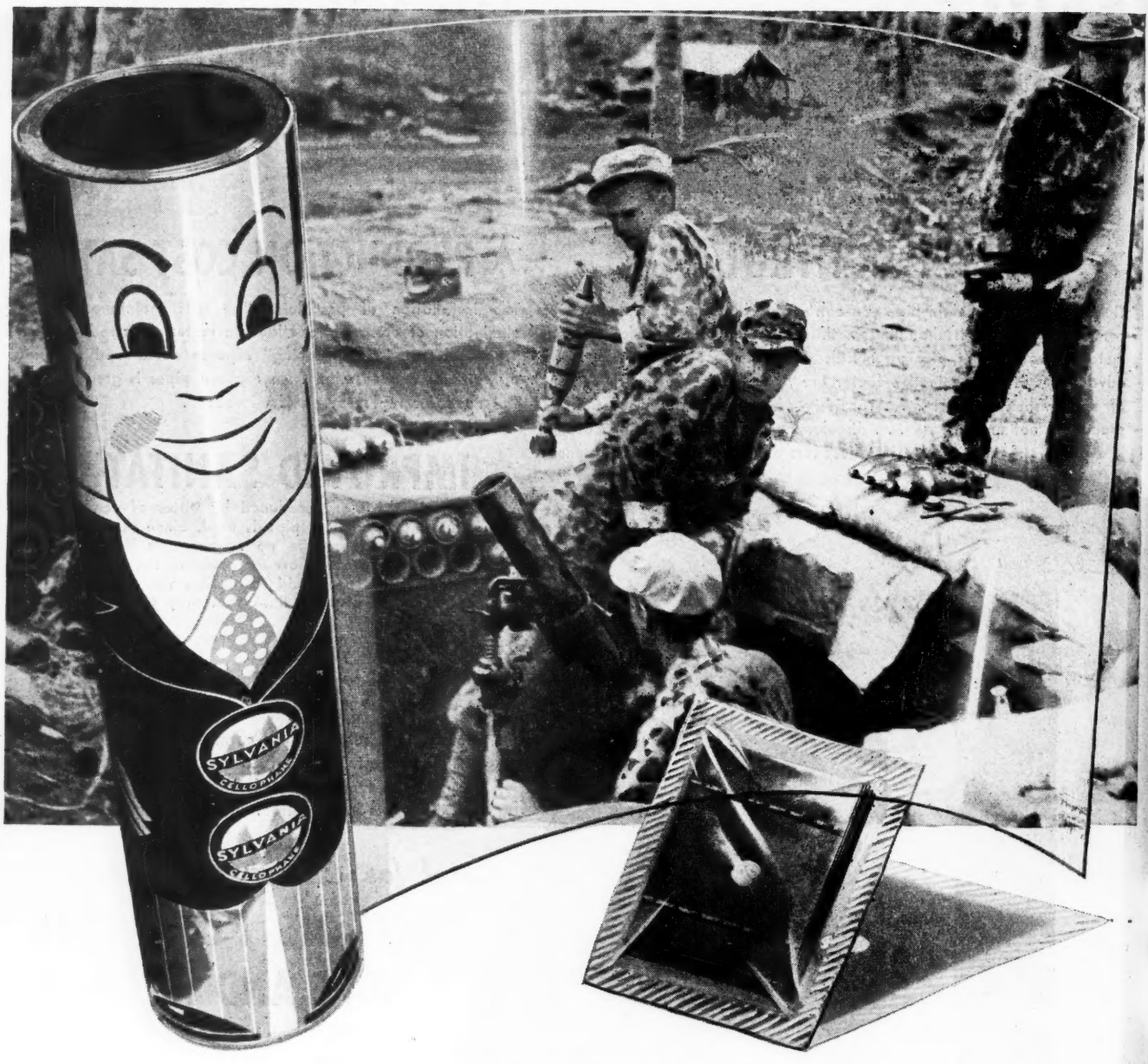
Send for Catalog No. C-1

ILLINOIS PORCELAIN PIPE AND FITTINGS

ILLINOIS high quality porcelain pipe and fittings are very accurately cut to length. Ends are ground absolutely smooth for gasketing. Flanges are assembled so that the bolt holes are in line. The flange faces are parallel to the ends. The inside and outside is glazed white. The porcelain fittings used with pipe are ground at right angles and to exact dimensions. Installation is fast and simple.

ILLINOIS PORCELAIN FOOD PROCESSING

ILLINOIS ELECTRIC PORCELAIN CO. *Macomb, Illinois*



Keeping the Powder Dry... vital job for Mr. Cellophane

IN THE HIGH HUMIDITY and heavy rain of the Pacific jungles, the old axiom "Keep your powder dry" becomes acutely important. For example, water and moisture-vapor can ruin the effectiveness of propellant powders used in trench mortar ammunition. A special cellophane wrap developed in Sylvania's laboratories keeps the powder perfectly dry from the time it leaves the plant until it is fired.

Sylvania cellophane is doing many vital war jobs. But the unique developments Sylvania is making today will result in more uses for cellophane—and better cellophane—in the postwar tomorrow.

SYLVANIA CELLOPHANE

Made only by SYLVANIA INDUSTRIAL Corporation

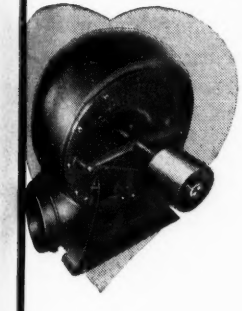
Manufacturers of cellophane and other cellulose products since 1929

General Sales Office: 122 E. 42nd St., New York 17, N. Y. ★ *Works and Principal Office:* Fredericksburg, Va.

SYLVANIA CELLOPHANE Trade Mark

ID YOU EVER BUY A POUND OF AIR?

These "Buffalo" Fans Each Deliver Over 33,000 Tons of Air Every 24 Hours



e FAN is the heart of y AIR system. With a ffalo Fan the system always up to par.

American manufacturers, long accustomed to volume production, have multiplied that production many times. In the chemical field, for example, a prominent producer of an important product needed more process AIR than ever before anticipated. He called in "Buffalo" engineers and the two giant fans shown above are now on the way to his plant.

Each of these fans delivers 618,000 cubic feet of air per minute, more than 33,000 TONS of air every twenty-four hours. If it were possible to direct the air from these two fans in a stream one foot thick, by twelve feet wide it could circle the earth at the Equator in a day. A shaft of air a foot square could go to the Moon and back in less than two days.

"Buffalo" builds process fans, air conditioning equipment, heating, cooling and ventilating equipment, as well as mechanical draft apparatus. The fans shown above are probably much larger than you will ever need . . . but when you do need fans . . . remember that "Buffalo" has a reputation for fine performance and low operating and maintenance costs all over the World. It costs no more to buy "Buffalo", why not have the best?

"Buffalo" "First ... ns"

BUFFALO FORGE COMPANY

BUFFALO New York • BUFFALO PUMPS, INC. • THE GEO. L. SQUIER MFG. CO. CANADIAN BLOWER & FORGE CO. LTD. • CANADA PUMPS, LTD.

Buy WAR BONDS

Ah those Wonderful Brickbats!

Sometimes, brickbats do a lot of good. For instance—

Some years ago, there was talk that beer drinkers would appreciate the convenience of beer in cans . . . that beer in cans would be a fine thing from the brewer's angle, too.

But, at the time we're speaking of, beer had never been successfully put in cans. And an awful lot of brickbats were tossed around as this packaging problem progressed. Here are some of them:

▸ **"The public** *will never accept beer in cans.*" This brickbat only made us more stubborn. Today, canned beer is preferred by millions.

▸ **"You'll never** *find a can that will hold 80 pounds per square inch of pressure.*" This brickbat spurred us on. We designed such a can.

▸ **"You'll never** *find a suitable lining.*" We did. Our suppliers helped materially. Eventually they produced it to our rigid specifications and in tremendous quantities as production increased.

▸ **"You'll need** *special filling machinery. You haven't got it.*" Designs were made and a machine built. Then with the aid of filling machine companies, the needed machinery for mass production was turned out.

P.S.

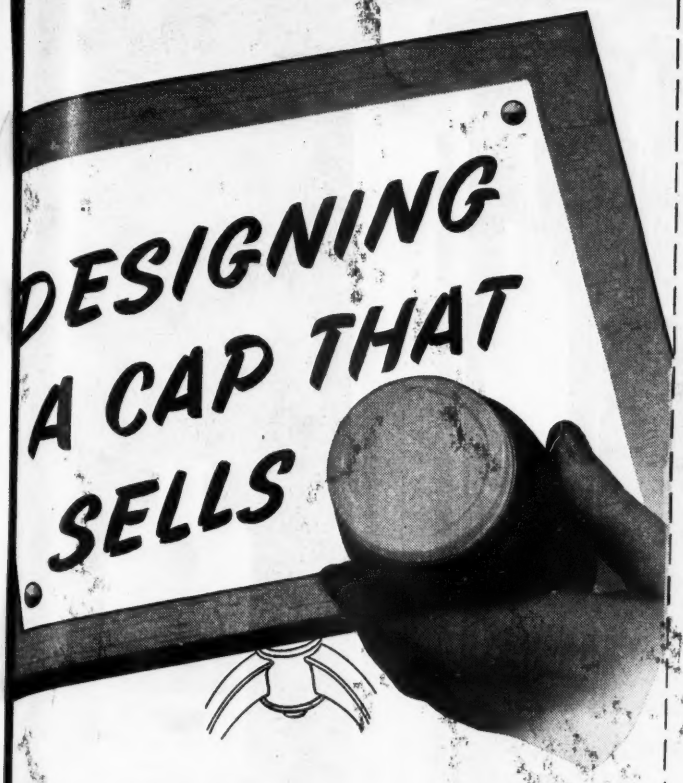
"Nobody can *open canned beer with an ordinary opener.*" So we made an opener which was distributed free. Launched our canned beer in Richmond, Virginia. Virtually overnight, it was a national wow.

Yes, opposition heaved brickbats at every step in developing the famous can for beer and ale trade-marked "Keglined." But—ah, those wonderful brickbats!—they only drove us on.

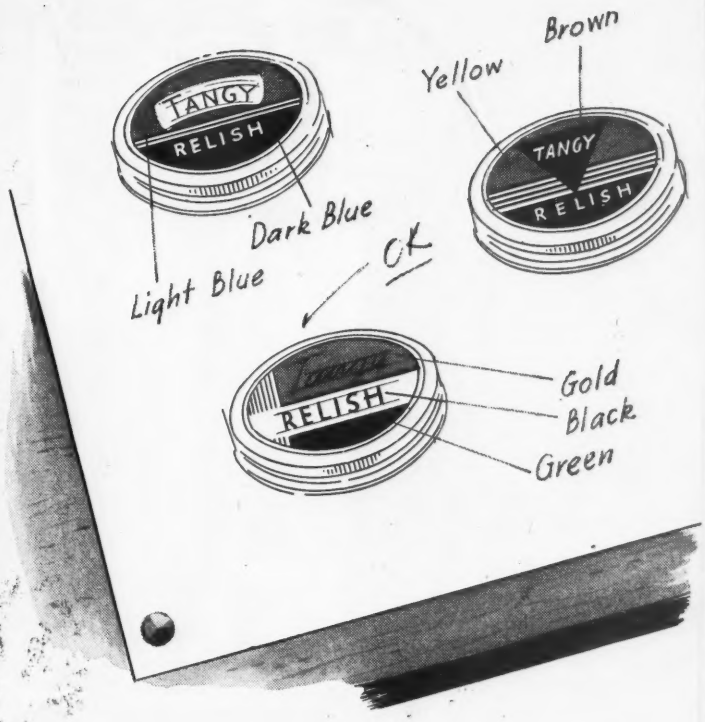
There are scores of other packaging problems which we have solved in the face of equal difficulties. Why not let us tackle the ones you'll be bucking up against after the war? Our research facilities are unparalleled. And we like brickbats. Consult our representative or write:

AMERICAN CAN COMPANY

230 PARK AVENUE ★ NEW YORK 17, N.Y.



1. MAXIMUM SALES APPEAL is packed into the ertising space on Armstrong's Metal Caps by expert igners who choose . . .



2. A BOLD, DISTINCTIVE background design, in vivid colors, to help pop your package out in display. Then . . .

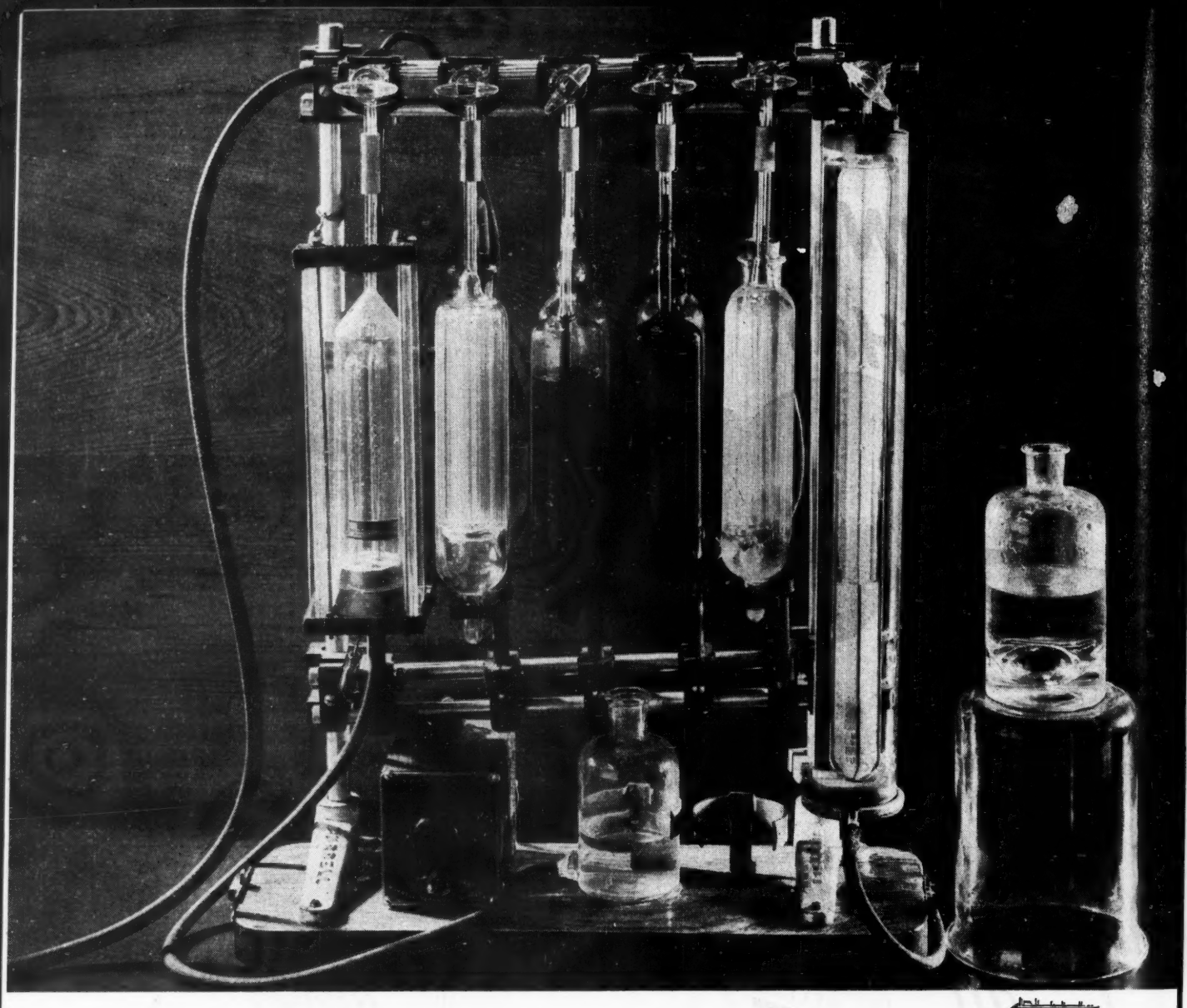
3. YOUR NAME, or trade-mark, in contrasting ors, is smartly styled for quick reading and long re- mbrance. Put together, and . . .

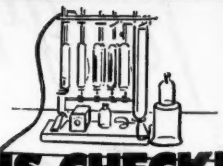
4. HERE YOU HAVE a cap design that builds extra sales. It will catch customers' eyes in the store, impress your name upon them every time they use your product.

Armstrong's Closures

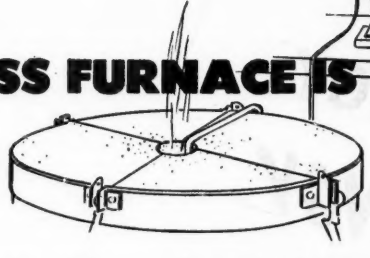
URN STANDARD CONTAINERS INTO STANDOUT PACKAGES

Will you let us show you what we can do with your caps? Just send a sample of your package to Armstrong Cork Company, Glass and Closure Division, 4212 Prince Street, Lancaster, Pa. No obligation, of course.





EVEN THE "BREATH" OF A GLASS FURNACE IS CHECKED



Research leaves nothing to chance in its efforts to make better glass

IF you've ever adjusted the air feed on a burner—like the one on your kitchen gas stove—you know that when the flame doesn't get enough air, it burns yellow and smoky and deposits soot on utensils. Much the same is true of a glass furnace. And that's why Armstrong's glass chemists keep a constant and accurate check on the amount of air their glass furnaces "breathe."

For when a glass furnace doesn't get enough air, it is inefficient, and the quality and color of the glass are affected. On the other hand, if a glass furnace should get too much air, this also will affect the quality of the glass produced.

So in order to make sure that their glass furnaces get just the right amount of air for proper combustion, Armstrong's glass chemists constantly check the furnace gases with gas analyzing apparatus. They pass a measured amount of the "exhaled" gases through reagents. From the amount of gas absorbed by each liquid, they can tell if the furnace is "breathing" properly.

This precise control over the breathing of a glass furnace is another practical demonstration of how the work of Armstrong's glass chemists, engineers, and physicists—closely coordinated with actual production—is helping to make, and keep, Armstrong's glass top quality.

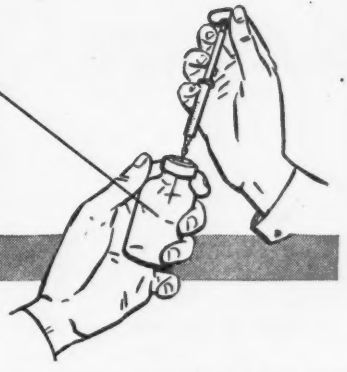
Other interesting examples of the painstaking care and skill that go into the making of fine glass are contained in an illustrated booklet, "Men and Glass." For your free copy, write to Armstrong Cork Co., Glass and Closure Div., 4212 Prince Street, Lancaster, Pa.

ARMSTRONG'S GLASS

***and* ARMSTRONG'S CLOSURES**

INSULATION helps speed penicillin production

Armstrong's Corkboard and Cork Covering help maintain exact temperatures in mass production of this wonder drug



AT several stages in the production of penicillin, unvarying temperatures must be maintained to prevent contamination. In processing this life-saving drug, precise low temperatures must be held to keep the protein content "fixed," and thus retain its potency. Certain vats and rooms are refrigerated, and the air in them is sterilized. In these air-conditioned and refrigerated areas, insulation plays a vital part in holding the correct temperatures regardless of outside conditions.

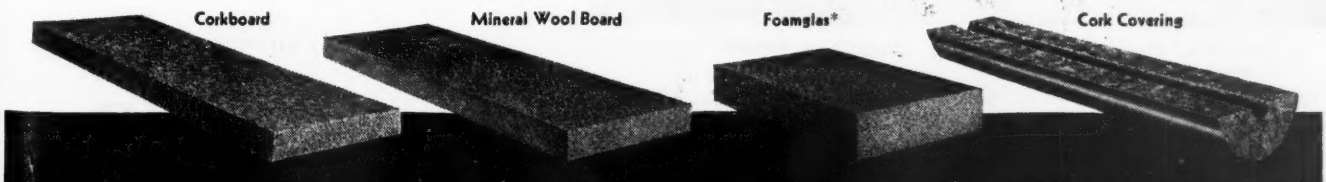
In selecting insulation for these areas and refrigerating equipment, absolute dependability was a prime requirement. That is why Armstrong, with its 40 years' experience in the manufacture and application of low-temperature insulation, was called upon to insulate several penicillin plants. Armstrong's Corkboard and Cork Covering have already helped to produce billions of units of this wonder drug.

New problems of low-temperature control come to Armstrong engineers year after year. Each problem is solved in a practical way because they have handled a variety of low-temperature insulation jobs, both simple and complex, in many fields.

In three important ways, Armstrong's "know-how" follows through to assure dependable insulation. Armstrong offers first, a complete line of efficient materials including Corkboard, Mineral Wool Board, Foamglas*, Cork Covering, and sundries for their efficient erection; second, practical engineering aid in planning and designing the insulated structure; and third, proper installation—for all Armstrong offices and distributors maintain crews of skilled mechanics.

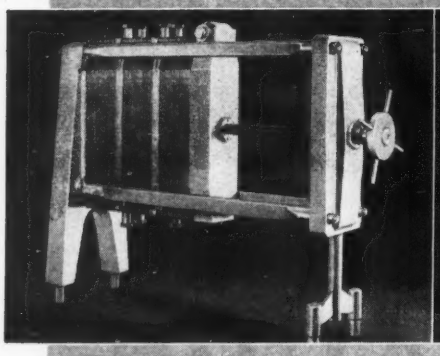
For complete information, write today to Armstrong Cork Company, Building Materials Division, 4212 Concord Street, Lancaster, Penna.

* Reg. U. S. Pat. Off. Product Mfg. by Pittsburgh Corning Corp.

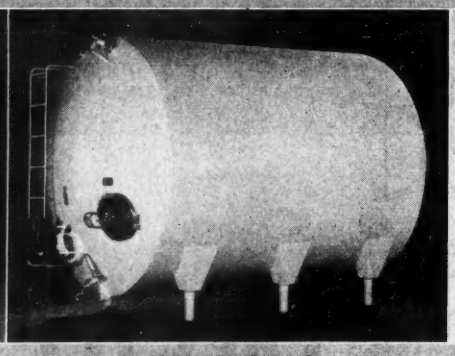


ARMSTRONG CORK COMPANY

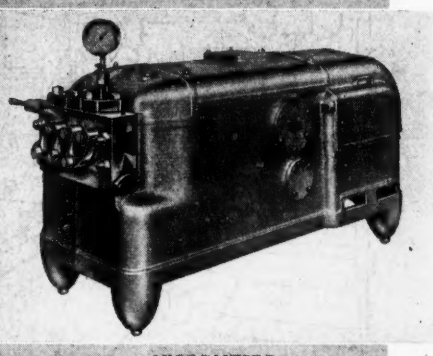
Insulation Ⓐ Headquarters



SUPERPLATE Heaters, Coolers, Regenerators, Pasteurizers

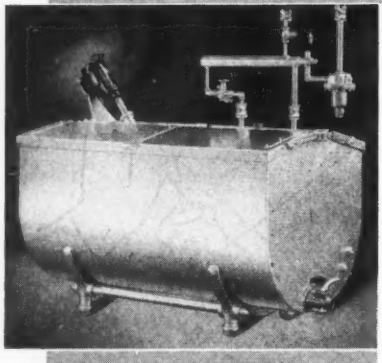


STORAGE TANKS



VISCOLIZERS

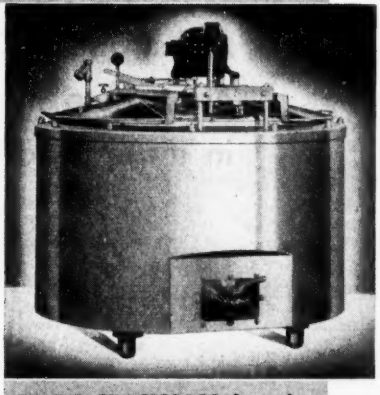
EQUIPMENT *worth knowing about*



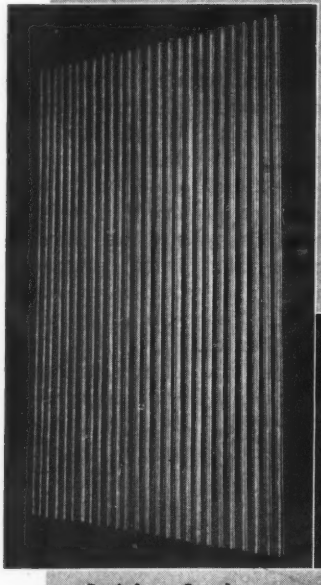
VATS for cooling, holding, storage

Cherry-Burrell equipment is made to meet the highest standards in the food processing industry — not only from the standpoint of the process, but equally as important — sanitation.

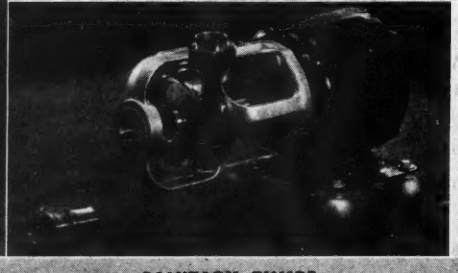
Cherry-Burrell engineers have served the exacting needs of food plants over 50 years. We are interested in helping you solve your processing problems. Write for information on the equipment that interests you.



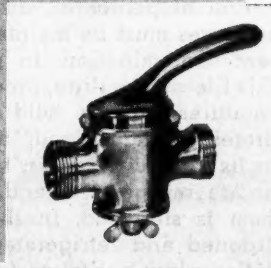
ROUND PROCESSORS for mixing, heating, cooling, holding

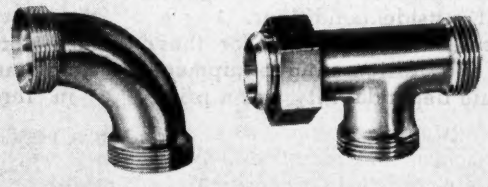


Stainless Steel SANITARY PIPE



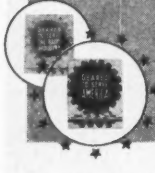
SANITARY PUMPS





SANITARY FITTINGS

BUY WAR BONDS REGULARLY — AND GENEROUSLY!



CHERRY-BURRELL CORPORATION

427 WEST RANDOLPH STREET, CHICAGO 6, ILLINOIS

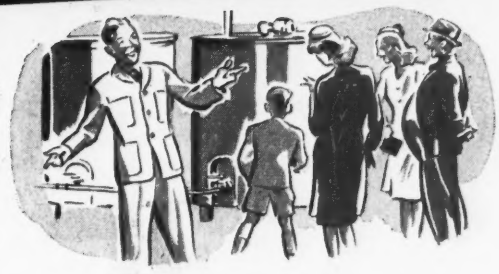
★ ★ ★

FACTORIES, WAREHOUSES, BRANCHES, OFFICES OR DISTRIBUTORS AT YOUR SERVICE IN 52 CITIES

facts to remember when you buy New Processing Equipment

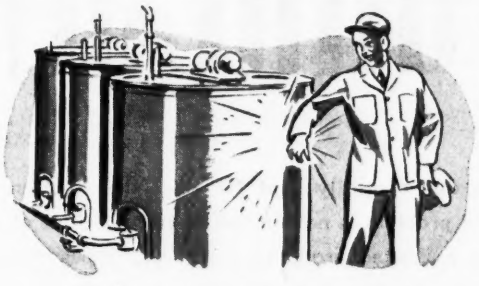
Food plants that rely on efficient equipment to keep sales volume and profits in high gear are planning *now* to modernize for peacetime. Their worn or inefficient processing machines are ticketed for quick replacement.

Many of these plants will install equipment made of ARMCO Stainless Steel. This rustless metal combines customer-appeal with many advantages in processing.



"Visitors Welcome"

You can be sure that visitors will be greatly impressed by the attractiveness and sanitation of your stainless steel equipment. It puts you in "solid" with present customers as well as prospects.

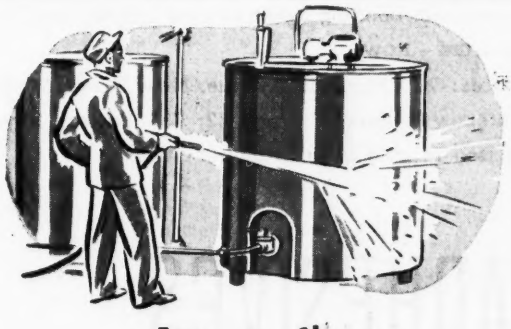


It Stays Bright

ARMCO Stainless Steel stays mirror-bright and attractive through many years of service. It is a *solid* rustless metal. There is no coating or plating to wear off and require costly refinishing.

No Off-Taste Here

The smooth surface of ARMCO Stainless is strictly "neutral." It does not alter the flavor, appearance or keeping qualities of food products. Milk keeps its natural sweet taste during and after processing.



Easy to Clean

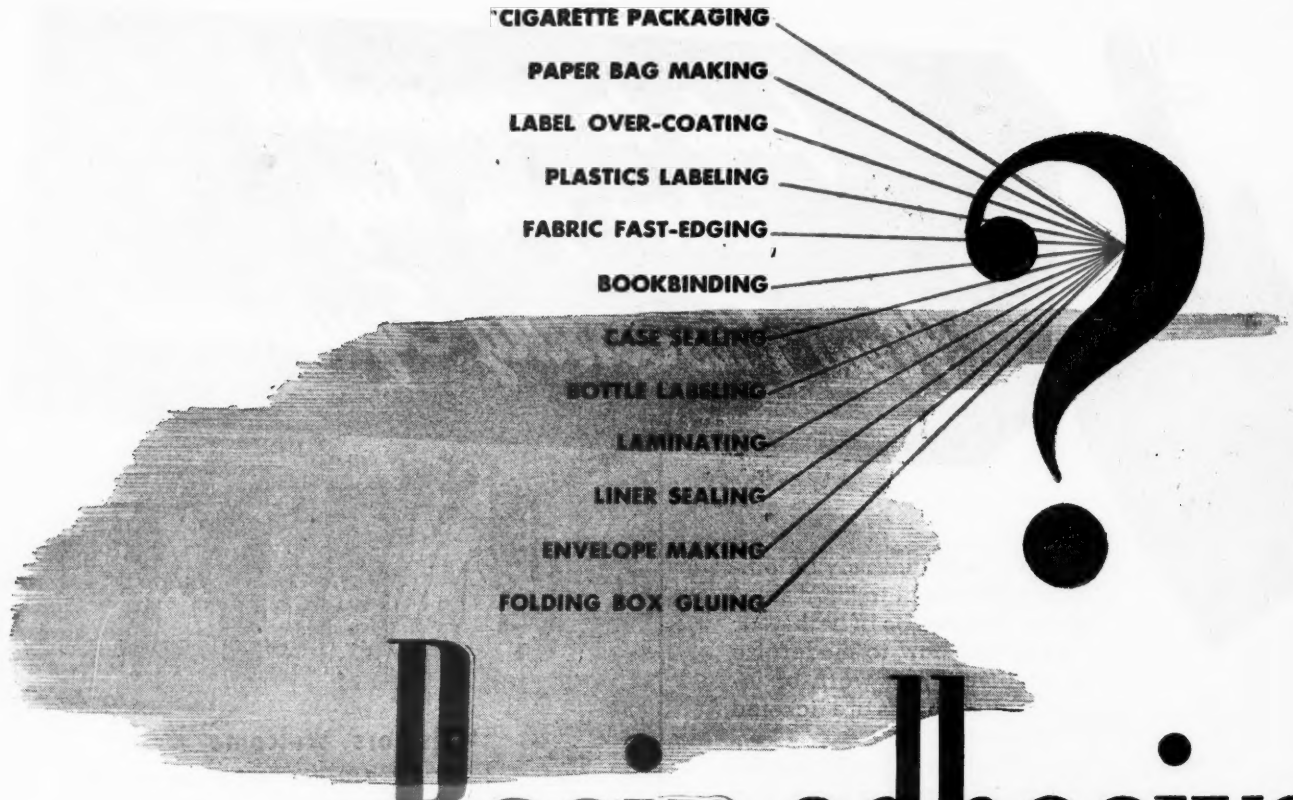
Stainless is easy to keep clean, bright and sanitary. A few minutes' work with a hose and hot water does the trick. The smooth surface does not become discolored in contact with milk or food acids.

If you wish more information about this ideal metal for food processing equipment, just get in touch with your equipment manufacturer. Or write to The American Rolling Mill Company, 3021 Curtis Street, Middletown, Ohio.*

**If you have stainless steel equipment in your plant write for a copy of the valuable free folder, "Stainless Steel Equipment and Its Care in Beverage, Dairy and Food Plants."*

STAINLESS ARMCO STEEL

THE AMERICAN ROLLING MILL COMPANY



is the answer a Resin adhesive

Experience shows that many amazing developments have resulted from the application of Resin Adhesives to packaging, converting and assembling operations previously thought to be at their highest level of efficiency.

In bookbinding, for example, a resin adhesive has eliminated the age-old production bottleneck of drying speed: It is now possible to glue-off, then round and back books in 20 minutes instead of 3 to 4 hours. In packaging, a resin adhesive is giving important new moisture protection to cigarettes. In specialty bag making, a resin adhesive makes it possible to safely ship coal, asphalt, fertilizer and many other products in less expensive, more convenient containers.

Note this carefully ... at National the solution of any adhesive problem is not limited to formulations of a single type or a limited group of resins. All types, both singly and in blends of high complexity, are employed. *And each recommendation of a resin product must justify itself competitively with every other type of adhesive.*

You can safely rely on National ... a specialist for half a century in all types of industrial adhesives and a pioneer in the development of synthetic resin adhesives ... to engineer the one exact bonding agent to your specific job. Inquiries are invited – NOW!

Offices: 270 Madison Avenue, New York 16; 3641 So. Washtenaw Avenue, Chicago 32; 735 Battery Street, San Francisco 11, and other principal cities.

national ADHESIVES

EVERY TYPE OF ADHESIVE *FOR EVERY TYPE OF ADHESION*

OWI Photo by Palmer in an Allegheny Ludlum plant

AMERICAN TREASURY...THIS YEAR'S STYLE

HAND BOOK OF SPECIAL STEELS

Newly revised and reprinted—a comprehensive book on the properties, uses, and best methods of handling, treatment, etc. of tool, stainless and other alloy steels. Plenty of tables to facilitate quick reference and selection. 136 pages, pocket-sized, latest data.

SEND FOR YOUR COPY

Address Dept. F.I.-26

THOSE slabs and billets of special high-alloy steels, awaiting further processing in Allegheny Ludlum plants, are raw materials for the world's finest mechanical equipment. They're also the main reason *why* it's the finest. Special steels give the extra performance—the superior electrical properties, or strength and toughness, or resistance to heat, wear and corrosion, as the case may be—that gives one product the edge over another.

That is true for combat equipment, and it's true for commercial products. Our principal high-alloy products are corrosion and heat-resisting, tool and die, electrical, valve and nitriding steels. Many of them we originated. Let us help you to fit them into your products and plans, and to handle them economically.

AL

STEEL FOR THE NATION'S WELFARE

Allegheny Ludlum STEEL CORPORATION

BRACKENRIDGE, PENNSYLVANIA

W&D A-9338

FABLES and FACTS about FOODS and flavors

WITHOUT THE FANFARE of publicity that has characterized so much of the work closely allied with the war effort, our flavor and essential oil industry has done a job in the last few years of which it can be truly proud. Responding to the unprecedented needs of the armed forces, it has continued to keep the food products of the nation appetizingly flavored in spite of the crippling losses of many of its most important raw material sources of supply. Only those intimately associated with this work can fully appreciate the monumental problems that have been overcome in keeping this country's flavoring formulas adjusted to the regulations and exigencies imposed by the present lack of many vital raw materials.

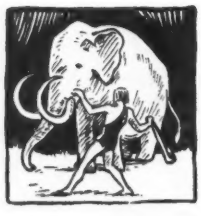
—F. B.—

Cassia or Chinese cinnamon bark, according to most authorities, was in all probability the first spice used for human consumption. Records prove its use prior to 2700 B.C. Today, thanks to the availability of excellent laboratory-made cassia oil imitations in ample supply to replace the genuine spices whose sources are restricted by war, this continues, after 46 centuries, to be one of the most important and useful of flavors.

—F. B.—

DUE TO THE LOW COST and amazing fidelity of such scientifically duplicated replacements as F.B. OIL OF CASSIA IMITATION, there is good reason to believe that many producers of foods, candies and beverages will continue to use this product in preference to genuine cassia even after the latter's availability has been fully restored.

—F. B.—



Had not man learned the domestication and breeding of animals, most creatures would have gone the way of the great mastodons which prehistoric Europeans seem to have exterminated in their age-old quest for food. That was the near fate of the American bison which provided not only good hunting but mighty good food.

—F. B.—

THE INFAMOUS ROMAN EMPEROR, Heliogabalus, made quite a name for himself in his short 4-year reign, not only for his profligacy but for his fabulous banquets and fancy menus. It was not unusual for him to have the brains of 500 or 600 ostriches served at a single repast along with generous assortments of heads including those of parrots, pheasants and peacocks!

—F. B.—

The first Biblical reference to cooked animal flesh is made by Noah in The Book of Genesis.

"CONTROLLED" SEASONING — what it is and why — is the subject of a little pamphlet entitled, "A More Efficient Seasoning Technique" which will be sent promptly and without cost to any food manufacturer upon request. Just drop us a postcard, today, for your copy.

—F. B.—

"A pound of dirt a day keeps the doctor away." That's a poor paraphrase for an old but popular adage. Furthermore, it's a moot question whether certain Indian stalwarts who were known to have subsisted on this unique diet for considerable periods, would affirm its truth, even if they could, after such indulgence.

—F. B.—

OIL OF MARJORAM is one of the most useful flavoring agents for seasoning canned meats, sausages, soups, spice bouquets and other food products. In the days of Dioscorides, the Greek herbalist, marjoram was used as the basis of a popular liqueur which he refers to as "wild marjoram wine."

—F. B.—

JUST HOW LONG can a person live without partaking food? The limit of human endurance, so far recorded is about two months.

—F. B.—

Fasting of such duration is hardly recommended as conducive to long life, although occasional fasting in moderation is. This can be better appreciated when it is realized that the average human stomach is the temporary repository for almost a ton of food per year — thus it sometimes needs a rest!

—F. B.—

HERE ARE SOME of the finished products for which we make special flavors: Candy, chocolate, chewing gum, baked goods, tooth paste and powder, astringents, meat products, desserts, animal foods, wines, cordials and whiskies, cattle feed, animal remedies, cigars and cigarettes, chewing tobacco, vitamin products, laxatives, cheese, fountain syrups, mayonnaise, canned soups, beverages, drug products, vinegar, condiments, canned meats, sauces, sausages, sauerkraut, pickles, bologna, vegetable oils and fats, popcorn, mince meat, preserves, salad dressings, ice cream, patent medicines, snuff, prepared foods, soft drinks, veterinary supplies, root beer, ginger ale, doughnuts, cough drops, jelly powders, mustard, puddings, frankfurters, extracts, dairy products and . . . well, that gives a fair idea of the range and variety of products in which our flavors are now being used. In short . . .

There's a FRITZSCHE FLAVOR for EVERY PURPOSE!

FRITZSCHE BROTHERS, Inc.

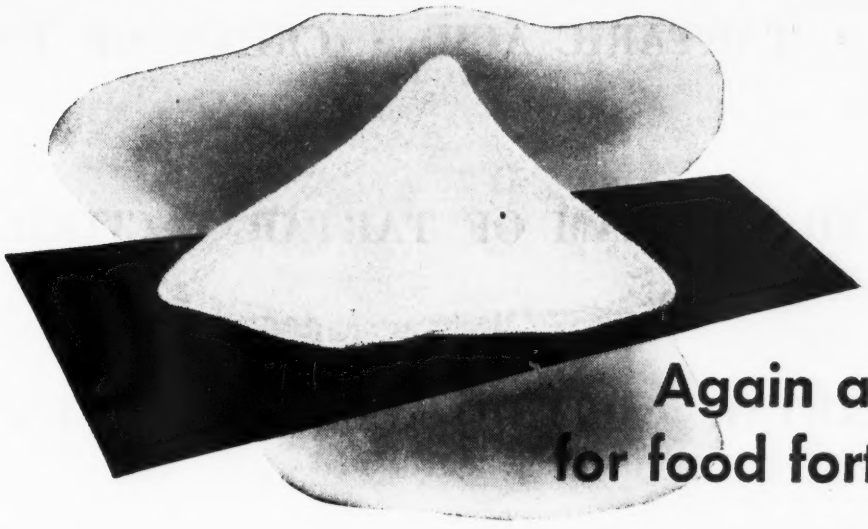
PORT AUTHORITY COMMERCE BLDG., 76 NINTH AVENUE, NEW YORK, N. Y.

BRANCH STOCKS

BOSTON CHICAGO LOS ANGELES ST. LOUIS TORONTO, CANADA MEXICO, D.F.

FACTORIES AT CLIFTON, N. J. AND SEILLANS (VAR) FRANCE

Copr. 1944 by F. B., Inc., N. Y.



Again available for food fortification

MYVA-DRY VITAMIN A POWDER

The stringent allocation of vitamin A during recent months put almost a complete stop to the production of our interesting new product known as Myva-Dry, the concentrate of vitamin A in dry powder form.

To a number of food processors this was a stroke of bad luck. Some were already using Myva-Dry for vitamin A fortification of their products. Others were experimenting with it, getting ready for continued use. Now (to a reasonable degree) the lid is tilted. We are again making Myva-Dry Vitamin A Powder. While WPB allocations still control quantity, a more normal production and supply situation exists.

We invite you to investigate this unique dry concentrate of vitamin A and its special advantages for food fortification. And, if you already have investigated, here is your green light. Write to us for a descriptive booklet and a free sample of the material.

What you want to know about MYVA-DRY

Q. What is Myva-Dry?
A. Myva-Dry is a dry powder containing distilled concentrate of vitamin A. It is a new form that makes possible the A-fortification of a host of food products that cannot assimilate an oil concentrate.

Q. Is Myva-Dry as Stable as Oil Concentrate?
A. Yes, and then some. DPI's research laboratory reports that Myva-Dry has the highest stability of any commercial source of vitamin A—liquid or solid—that it has yet measured.

Q. Does Myva-Dry Affect Flavor?
A. Myva-Dry cannot have the slightest effect on flavor of the most delicate food product.

Q. How about Incorporation Control?
A. That's easy. Produced in uniformly fine, pulverized form, Myva-Dry blends perfectly with powdered foods and beverage powders. Protective carrier of the dry vitamin A concentrate is an edible, nutritious vegetable powder, and the vitamin A concentrate is evenly dispersed through this carrier for smooth, convenient incorporation.

DP INC

Distillation Products, Inc.

755 Ridge Road West, Rochester 13, New York

"Oil-Soluble-Vitamin Headquarters"

CITRIC ACID • TARTARIC ACID • CREAM OF TARTAR

TARTARIC ACID • CREAM OF TARTAR • CITRIC ACID

CREAM OF TARTAR • CITRIC ACID • TARTARIC ACID

CITRIC ACID • TARTARIC ACID • CREAM OF TARTAR

TARTARIC ACID • CREAM OF TARTAR • CITRIC ACID

CREA TART

CITRI ACID

TART ACID

CREA TART

PFIZER QUALITY

Est. 1849

Chemicals For Those Who Serve Man's Well-Being

Manufacturing Chemists

CHAS. PFIZER & CO., INC.

81 MAIDEN LANE, NEW YORK, N. Y.

444 W. GRAND AVE., CHICAGO, ILL.

CITRIC ACID • TARTARIC ACID • CREAM OF TARTAR

TARTARIC ACID • CITRIC ACID • CREAM OF TARTAR

Formula FOR A SUCCESSFUL PACKAGE

THE TECHNICIAN

First, Shellmar technicians visit your plant and make a personal study of your packaging, handling and production problems.

THE ENGINEER

Second, Shellmar engineers submit your product to extensive laboratory testing in conjunction with various functional materials.

THE DESIGNER

Third, Shellmar package designers create a colorful and eye-appealing design to insure maximum attention to the product.

Into every successful package must go the services of these three . . . . the technician, the engineer, the designer. For each plays a vital part . . . . each contributes his particular skill and experience. Here at Shellmar our actual production is still largely devoted to war but these three important package planning services are immediately available. Why not call in Shellmar now?

SHELLMAR

PRODUCTS COMPANY

ARMY E NAVY

COMPLETE PACKAGING SERVICE TO INDUSTRY

224 S. Michigan Ave.
CHICAGO, ILL.
MOUNT VERNON, OHIO
PASADENA · CALIFORNIA
3115 Empire State Bldg.
NEW YORK, N. Y.

CONVERTERS OF CELLOPHANE, PLIOFILM, CELLULOSE ACETATE, SARAN, FOILS, PAPERS, GLASSINE, LACQUER COATINGS, VINYLS

VITAMIN D IN FOODS?
...*Why not?*

Who will be your customers tomorrow?

IN EVERY CROWD like this are some of your customers.

They buy your products because they believe they are the best available under present conditions. Yet, you may well afford to wonder now who will be your customers tomorrow.

In other words, how will your products line up for the post-war battle for position in the diet? Here is a factor you might consider:

Of all the vitamins and minerals needed for adequate nutrition, Vitamin D is the only one not found in appreciable amounts in the "Basic 7" food groups listed in the government food charts.

This situation poses an opportunity for product improvement and a chance to perform a distinct nutritional service in making Vitamin D universally available.

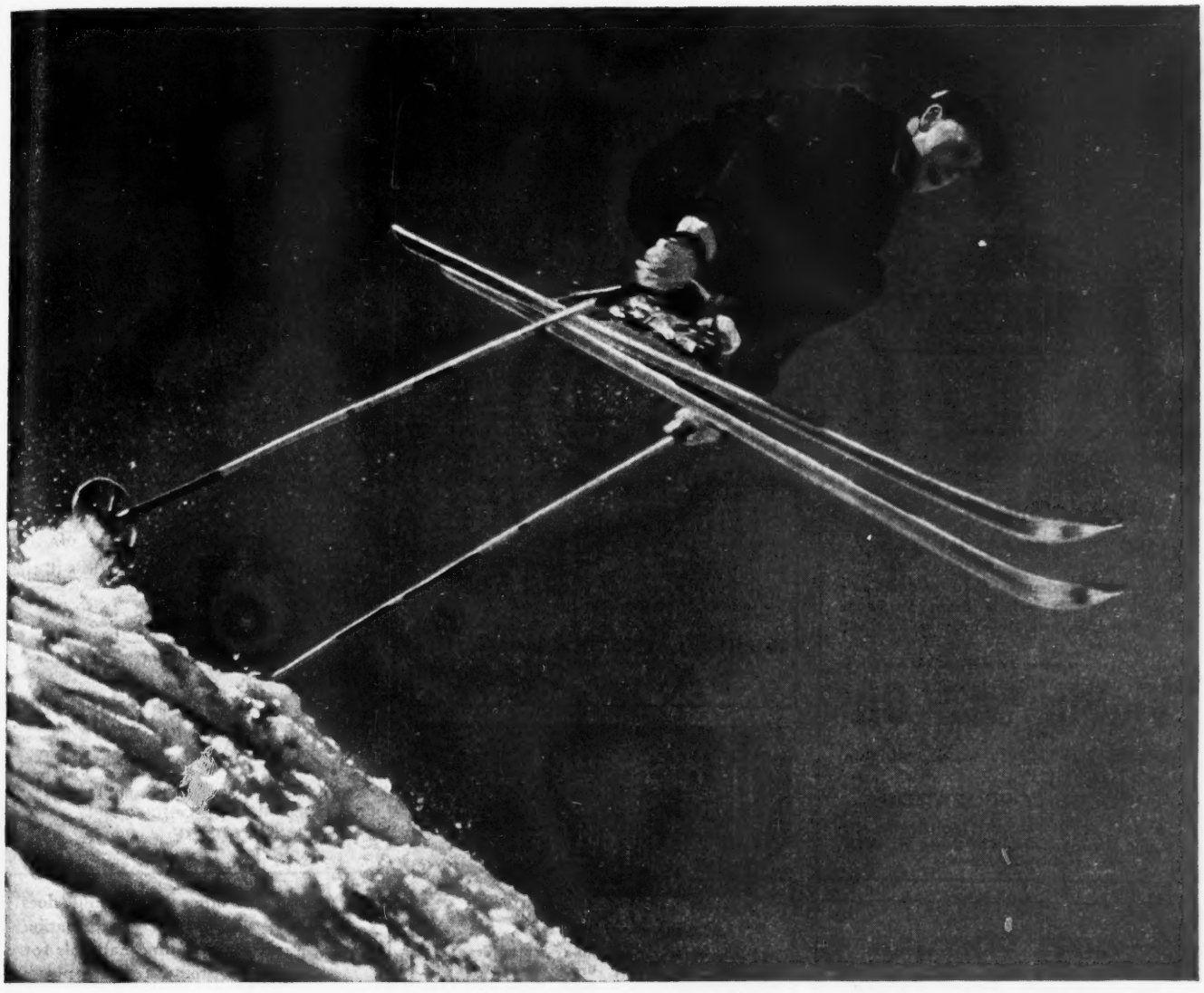
In fact, so important appears to be the need for this vitamin that its eventual use in food seems not only logical but necessary.

We invite you to write for more complete information regarding Vitamin D (A.R.P.I. Process) and its use in your own particular food product.

GENERAL MILLS, INC.
Special Commodities Division
Minneapolis 15, Minnesota

Facts about Vitamin D (A.R.P.I. Process)

● Vitamin D (A.R.P.I. Process) is produced by activation of pure crystalline ergosterol with low velocity electrons. Biologically standardized, it is available in several concentrations (U.S.P. units of Vitamin D per gram), in two types of carriers. Requires no special incorporation equipment and does not impart taste or odor to any foods fortified by it. *Not under allocation.* Readily available!



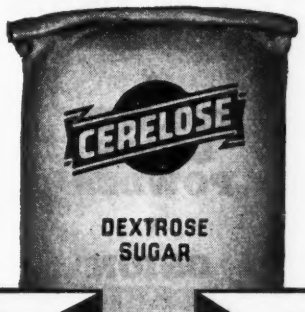
BALANCE!

Skiing calls for lightning-like decision — prompt action — perfect teamwork of mind and muscle.

Teamwork between producer, processor and distributor helped make consumers recognize the value of dextrose sugar as an important source of energy.

As the interesting advertising of dextrose continues, you can rest assured that public demand for foods "rich in dextrose" will increase as more and more people understand that *dextrose on the label means food energy in the product.*

Dextrose advertising appears regularly in leading national magazines; millions listen to dextrose radio advertising. That's why intelligent, nutrition-minded Americans prefer foods made with dextrose sugar.



Tune in
STAGE DOOR CANTEEN
Every Friday 10:30 to 11:00 P.M., E.W.T.
Columbia Network, Coast-to-Coast

CORN PRODUCTS SALES COMPANY
17 BATTERY PLACE NEW YORK 4, N. Y.

CERELOSE *is* DEXTROSE

MATERIALS
FOR THE FOOD MANUFACTURER

VioBin ANTIOXIDANT

An effective antioxidant in concentrations of 0.05 and 0.1%; for animal and vegetable fats.

DEFATTED, DEHYDRATED PERFECTLY STABLE

WHEAT GERM
CORN GERM

Richer in B complex than original raw germ. Among richest foods known in B complex high quality protein, iron and phosphorus.

VioBin WHEAT GERM Oil

Perfectly stable—requires no refrigeration.

VIOBIN CORPORATION

36 Oak St. Monticello, Ill.
Viobin (Canada) Ltd., 637 Craig St., West, Montreal, Quebec

WHITE VINEGAR

Aged two years—distinctive aroma
Made from grain
Natural color or water white
Up to 12% acetic acid content
Tank Truck, Tank Car or Barrel Delivery

New England Vinegar Works, Inc.
Littleton, Massachusetts

HYDROLYZED VEGETABLE PROTEIN
(PLANT EXTRACT)

For better flavors in Soups, Bouillons, Gravies, Sauces and many other food products.

THE HURON MILLING CO.
9 PARK PLACE, NEW YORK (7)
IN BUSINESS OVER 70 YEARS

Why does CARROT OIL make foods golden yellow?

Because carrot oil contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.

Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil, and because it contributes vitamin A of high stability and desirable golden yellow color.

Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

Also producers of ThiaBee, a stabilized wheat germ product rich in Vitamin B_1.

These vitamin products are of particular interest to all manufacturers of food products.

Inquiries are invited. Literature, prices and samples to firms requesting same on their letter heads.

NUTRITIONAL RESEARCH ASSOCIATES, INC.
201 Broad Street
South Whitley, Indiana

SH HIGH QUALITY and UNIFORMITY
Est. 1906

In our brands of . . .

Egg Albumen	Meatex Binders
Egg Yolk	Bread Improvers
Potato Flour	Bread Mold Inhibitors
Rice Flour	Stabilizers
Soya Bean Flour	Corn Starch
Bean Powder	Potato Starch
Tapioca Flour	Vegetable Gums
Pre-cooked Beans	Pure Food Dextrines

STEIN-HALL & CO., Inc.
285 Madison Ave. • New York 17, N. Y.
Boston • Providence • Chicago • Rochester
Philadelphia • Charlotte • Toronto • Buffalo
San Francisco • Los Angeles

DEHYDRATED YELLOW ONION POWDER
•
TOASTED ONION POWDER
•
ONION FLAKES
•
IVANHOE FOODS
Auburn, New York

Tartaric Acid

The acid of grapes is not under governmental allocation.

We can make prompt shipments to provide for your immediate needs.

We are accepting a limited number of contracts for 1945 requirements.

The most essential uses are being given first consideration—otherwise we are booking spot and forward business in the order received.

WILLIAM D. NEUBERG CO.
Chemicals
420 LEXINGTON AVE. • NEW YORK 17, N. Y.
TELEPHONE LEXINGTON 2-3324

If this or other advertising does not supply the information wanted concerning materials for the food manufacturer, please write:
FOOD INDUSTRIES

PIONEERS VITINC SINCE 1936 TRADE MARK

BASIC A AND D VITAMIN MANUFACTURERS

HEADQUARTERS FOR TECHNICAL INFORMATION

VITAMINS, INC.
809 W. 58th ST.
CHICAGO 21, ILL.

A MODERN TOOL FOR MODERN INDUSTRY

MEGATHERM* ELECTRONIC HEAT

Here is high-speed uniform heat—precision controlled and directed—offering tremendous possibilities for new products and new processes . . . for faster, more efficient production . . .

That's Megatherm—high-frequency electronic heating at its best—a modern tool with uses as broad as industry itself.

In the processing of plastics, foods, drugs, candy, paper, textiles, wood products, and in printing, book-binding . . . in the surface hardening of metals, brazing, soldering, and annealing . . . to mention only a few of an endless number of possible applications.

Megatherm is available in a range of compact, efficient models—powers from 3 kilowatts to 100 kilowatts. One of these models is right for your work.

Now, while you are planning for the future, is the time to get the story on Megatherm—learn how it will speed your production—cut your costs—make new designs—new products and new materials possible. Write for data.

FEDERAL TELEPHONE & RADIO — FTR

Federal Telephone and Radio Corporation

*Reg. U. S. Pat. Office

INDUSTRIAL ELECTRONICS DIVISION

AN IT&T ASSOCIATE

Newark 1, N. J.

SPECIFICATION ADHESIVES

EVERYONE realizes the importance of specifications in the building of planes, ships or bridges. But some people overlook the importance of specifications in the preparation of an adhesive. Each adhesive, to be completely satisfactory, must be a combination of ingredients chosen with scientific care to meet one specific problem.

For 59 years, Arabol has believed that there is one best adhesive for each industrial use, and has applied that principle to the development of more than 10,000 adhesives formulae . . . 1500 in the last two war years alone. The experience accumulated in service to 100 different industries is your assurance of Arabol's ability to produce *proved* solutions to practically any adhesives problem.

ARABOL V CASE SEALING ADHESIVES

meet specifications... fast setting, hand or machine quality.

Tell us your adhesives requirements, and an Arabol Service Engineer will be available for confidential consultation, without cost or obligation. Please address your inquiry to Dept. 118.

THE ARABOL MANUFACTURING CO.

PIONEERING SINCE 1885

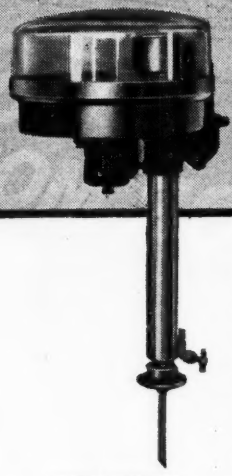
Executive Offices:
110 East 42nd St., New York 17, N. Y.
Offices and Factories:
BROOKLYN · CHICAGO · SAN FRANCISCO
Branches in Principal Cities

Adhesives? . . ARABOL!

For Highest Quality Water

STOKES ELECTRIC STILLS

with Automatic Overheat-Protection



SIX SIZES
from ½ to 1½ g.p.h. Also Gas and Steam Heated Stills from ½ to 100 g.p.h.

CONTINUOUS DISCHARGE OF IMPURITIES.

TRIPLE VAPOR BAFFLES prevent entrainment.

LONG-LIFE, NON-CORROSIVE METAL AND PYREX GLASS CONSTRUCTION.

ECONOMICAL OF CURRENT AND WATER. Large Boiling Area and Counterflow Condenser.

MORE THAN 20,000 IN USE IN EXACTING SERVICE.

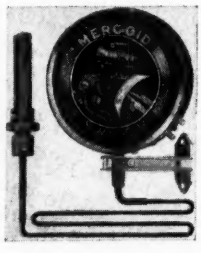
F. J. STOKES MACHINE CO.
5976 Tabor Road Philadelphia 20, Pa.

F.J.Stokes WATER STILLS FJS

MERCOID

SOLVES INDUSTRY'S AUTOMATIC CONTROL PROBLEMS

There is scarcely an industry that is not using a Mercoid Control somewhere on vital applications in the control of temperature, pressure, liquid level, mechanical operations, etc. *See catalog No. 600*



THE ONLY 100% MERCURY SWITCH EQUIPPED CONTROLS

Temperature Control—*For numerous applications. The operating range is plainly indicated on a visible dial. No guesswork—easy to adjust.*

Mercoid Switches—*A recognized superior brand of mercury switches available in tilting or magnetic types in various sizes and electrical ratings.*

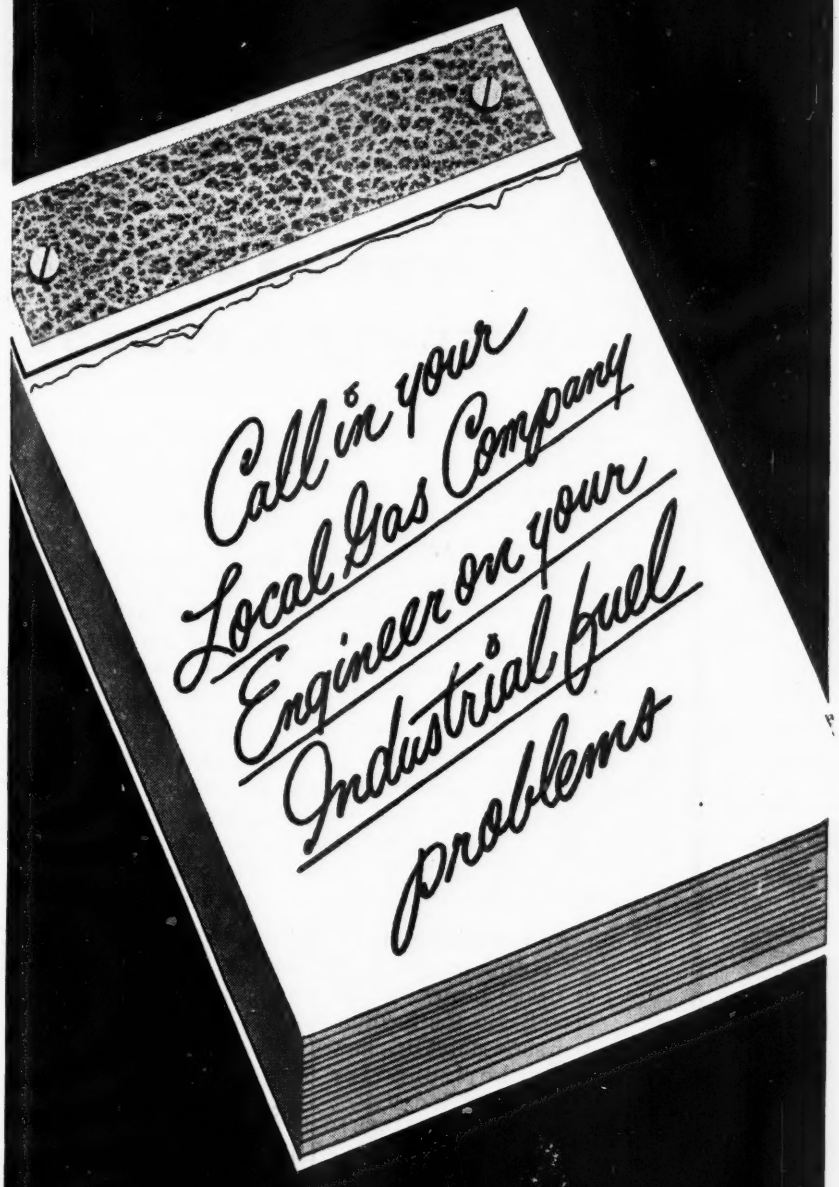
Mercoid Relays—*With mercury contacts. Transformer-relay type and others. Available in various circuits. Very dependable and quiet in operation.*

Pressure Control—*For various industrial applications. The operating range is plainly indicated on a visible dial. Adjustments are easily made.*

THE MERCOID CORPORATION
4235 Belmont Avenue, Chicago 41, Illinois

MANUFACTURERS OF AUTOMATIC CONTROLS FOR HEATING, AIR CONDITIONING, REFRIGERATION AND NUMEROUS INDUSTRIAL APPLICATIONS. ALSO MERCOID BRAND MERCURY SWITCHES.

Memo to Mr. Post-War Planner:



No further away than your telephone is an experienced engineer who has helped others, and can help you solve your industrial heating problems. That's part of the service your Gas company maintains so that manufacturers, now faced with reconversion or modernization of their plants, can learn all the advantages of Gas for their specific needs.

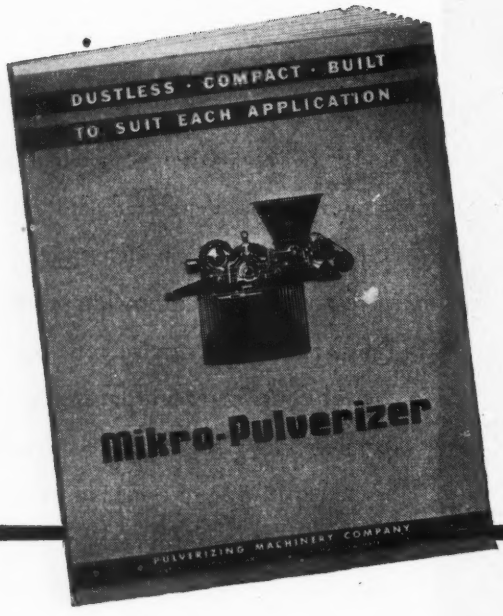
Gas is doing a great war job for industry. It has helped speed production, has proved most flexible and adaptable in many new applications. More and more industrialists have come to know and appreciate the superior values of Gas and have come to rely on their local Industrial Gas Engineers for considerable help on industrial heating problems.

Whatever your industrial heating operation may be, look into Gas first. Gas is a precision fuel, it is fully automatic in operation, it heats quickly, and is especially useful in complex operations. And Gas is economical. It will pay you well to study it for peacetime production.

BUY WAR BONDS—HELP SPEED VICTORY!

AMERICAN GAS ASSOCIATION
INDUSTRIAL AND COMMERCIAL GAS SECTION
420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

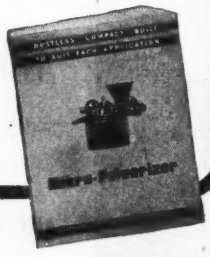
THE TREND IS TO GAS
FOR ALL
HEAT PROCESSING OF FOODS



If the manufacture of your product calls for pulverizing, granulating, wet milling, blending or dispersing. . . . THIS NEW CATALOG CAN BE AN IMPORTANT AID TO YOU.

Several sections of this 40 page book deal with the production problems of Food Manufacturers. Full details are provided on coarse, fine or superfine grinding of a wide range of processed foods to get superior products in a single *dustless* operation at highest efficiency.

Send for your copy today



PULVERIZING MACHINERY COMPANY
97 Chatham Road, Summit, N. J.

Mikro-Pulverizer

THE CANDY WITHOUT A FLAVOR

OF course, flavor is something that is taken for granted . . . because without flavor, candy *isn't* candy, a food product is just so much chemical matter, a soft drink is nothing but sugar and water!

Yet, for fifty years, a major portion of the "know-how" of our flavor chemists has been devoted to those who *don't* take flavor for granted . . . the manufacturers of a myriad of products who know that, through the magic of *distinctive* flavor personality, product preference is born and maintained.

As one of the world's great suppliers of Essential Oils and Concentrated Flavors, MAGNUS, MABEE & REYNARD, INC. has been privileged to furnish many of the flavor oils that provide hundreds of nationally-known products with their superlative taste appeal.

To manufacturers of pickles or pate de fois gras, ice cream or creme de menthe, bakery products or baked beans—to all enterprising producers who perceive in the medium of ESSENTIAL OILS new sales horizons for products of today . . . and *tomorrow,* MM&R flavor experts offer their cooperation.

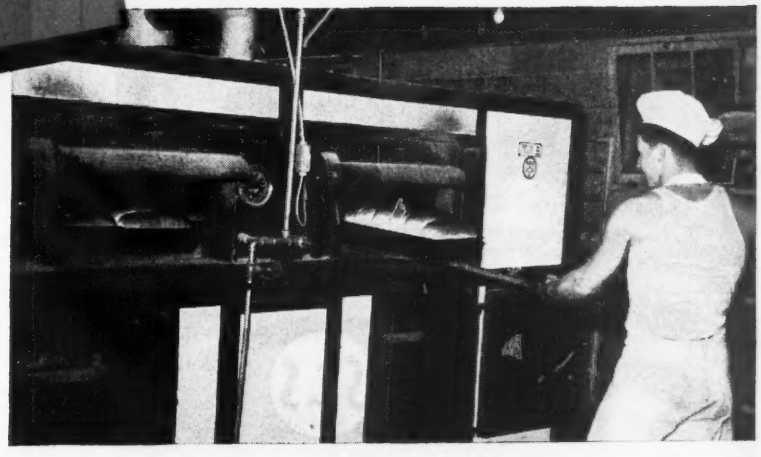
MM&R ESSENTIAL OILS AND FLAVORING MATERIALS HELP BUILD PRODUCT PREFERENCE

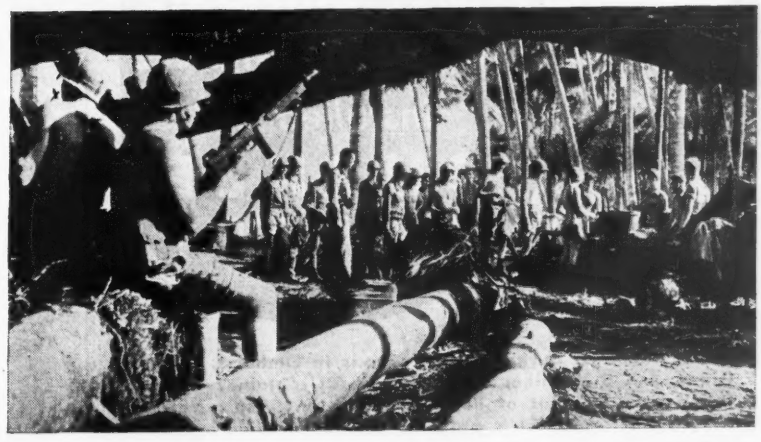
MAGNUS, MABEE & REYNARD, INC.

16 DESBROSSES STREET, NEW YORK CITY • 221 NORTH LASALLE STREET, CHICAGO

San Francisco: Braun-Knecht-Heimann Co. • Los Angeles: Braun Corp. • Seattle, Portland, Spokane: Van Waters & Rogers, Inc. • Toronto: Richardson Agencies, Ltd.

"DELIVERING THE GOODS" for Victory





...to Feed the Fields
...to Feed the Ovens
...to Feed the Men

ON wheat fields and battle fields, Multiwall Paper Bags are serving today. They help deliver needed fertilizer . . . they protect the flour . . . they assure the safe arrival of food for our fighting men and allies.

Multiwall Paper Bags are required for industrial shipments of food products, chemicals, fertilizers, and construction materials — for domestic use and overseas to our armed forces and civilian populations of allied nations and occupied countries.

St. Regis MULTIWALL PAPER BAGS

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

TAGGART CORPORATION

NEW YORK 17: 230 Park Ave. CHICAGO 1: 230 No. Michigan Ave.
BALTIMORE 2: 2601 O'Sullivan Bldg. SAN FRANCISCO 4: 1 Montgomery St.

IN CANADA:
BATES VALVE BAG CO., LTD.
Montreal, Quebec
Vancouver, British Columbia

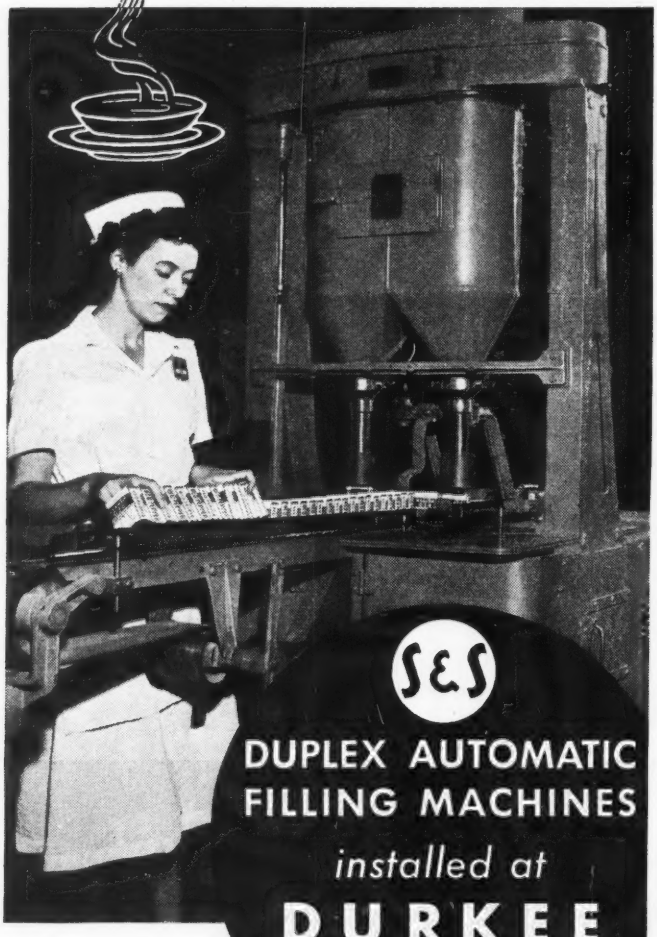
Boston, Mass. Birmingham, Ala. Dallas, Tex. Denver, Colo.
No. Kansas City, Mo. Los Angeles, Calif. New Orleans, La.
Franklin, Va. Seattle, Wash. Nazareth, Pa. Toledo, Ohio

FOR FILLING

The Spice of Life

STOKES & SMITH

EQUIPMENT IS PREFERRED



S&S

DUPLEX AUTOMATIC FILLING MACHINES

installed at

DURKEE FAMOUS FOODS

Illustration shows Model HG 84 Automatic Duplex Filling Machine.

At the home of Durkee Famous Foods in Elmhurst, Long Island, S & S Machines automatically fill containers with the desired amount of Pepper, Cinnamon, Allspice, etc. A clean, accurate fill is provided at 60 per minute production.

Now, while you are formulating your post-war plans be sure to consider your packaging requirements. Although we cannot supply S & S Machines to all as yet, our engineering department is able to help lay plans that can be fulfilled when restrictions are lifted. Send us samples . . . tell us your needs.

"Better Machines for Better Packages"

STOKES & SMITH Co

PACKAGING MACHINERY — PAPER BOX MACHINERY

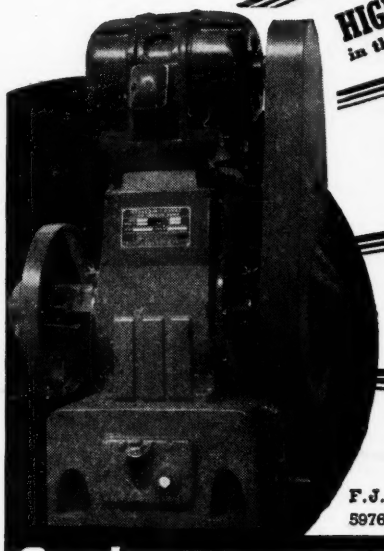
4911 SUMMERDALE AVE., PHILA. 24, U.S.A.

FILLING • PACKAGING • WRAPPING MACHINES

Speeds to suit your needs — 15 - 30 - 60 - 120 per minute

Stokes MICROVAC Pumps

HEART OF HIGH VACUUM SYSTEMS



HIGHER VACUUM in the Low Micron Range

GREATER VOLUMETRIC EFFICIENCY

LOW POWER REQUIREMENT

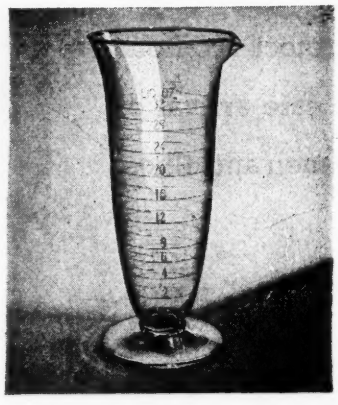
FIVE SIZES: from 15 to 225 cu. ft. per min.

F. J. STOKES MACHINE CO.
5976 Tabor Rd., Phila. 20, Pa.

Stokes *High Vacuum*

PUMPS • GAUGES • EQUIPMENT

LABORATORY GLASSWARE for the Chemical Industry



GRADUATES

We have a complete line of glassware for bottling plants. Our graduates have markings in white for easy reading and range from ½ ounce through 64 ounces, in both beaker and cone shape. We can make prompt shipment from our complete stocks.

GLASS FUNNELS

of pressed glass with ribs. From 1 pint through 1 gallon. We also carry sachrometer glasses and testers.

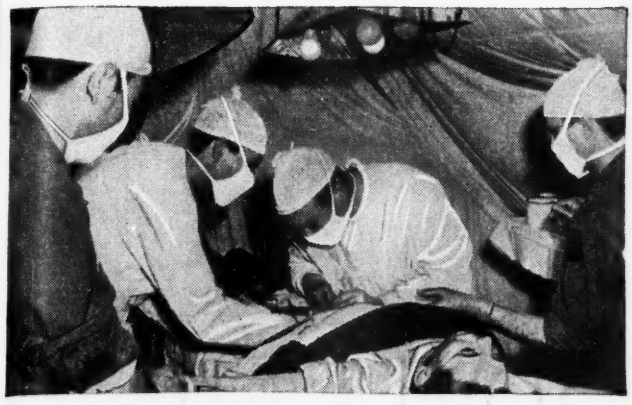
LIMITED AMOUNT OF STAINLESS STEEL 16-OZ. GRADUATES CALIBRATED IN OUNCES

We carry a full line of Filter paper. Also Hose for all purposes. Send us a sample of your needs.

CONSOLIDATED

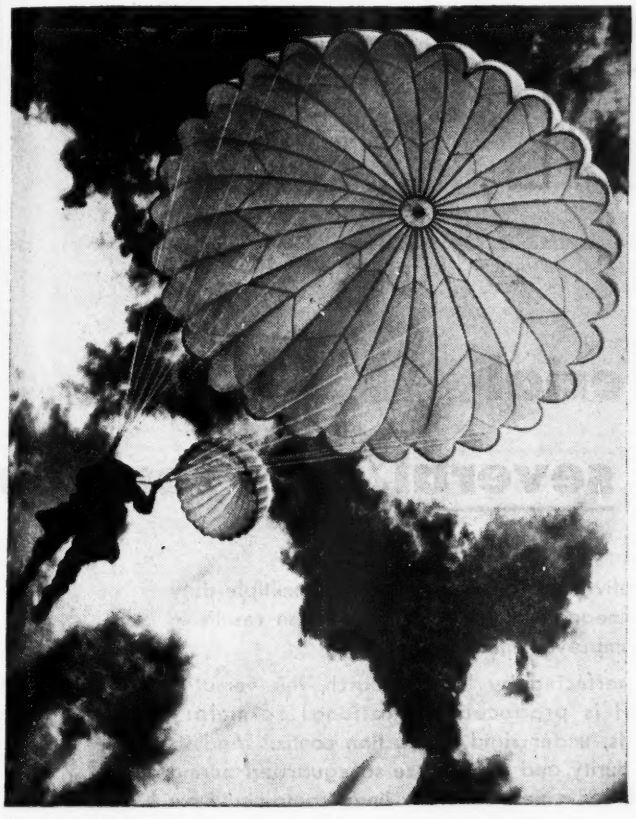
SIPHON SUPPLY CO., Inc.

Dept. F, 22-24 Webster St. New York, N. Y.



Lower mortality rate of wounded has been brought about by such medicines as sulfa ointments, which are prepared with safe, non-toxic glycerine. Use glycerine in making drugs and cosmetics.

Good eating! Pure, wholesome glycerine is safe in foods and food products. It is used in many kinds of army concentrated foods. Use glycerine in your food processing! You're safe with glycerine!



Hit the nylon! Nylon, used in making parachute shrouds, glider tow lines and other war essentials, is made with glycerine. In many vital war applications, where life is at stake, glycerine is used!

GLYCERINE, Vital War Material, Now Available to You!

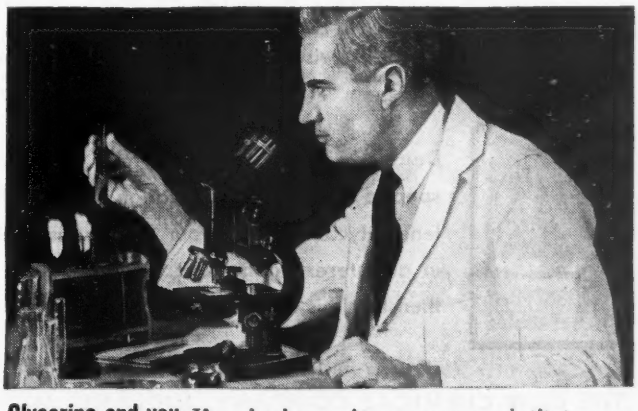
GLYCERINE, time-proven standby of American industry, is now off allocation. There is plenty of glycerine for civilian goods!

War needs for glycerine have been enormous. The Surgeon General's Office, the Medical Corps, the Ordnance Department and many other important agencies recognize the necessity of using *only* glycerine in the making of many vital articles. For a long while war needs came first on all glycerine produced.

But so successful have glycerine producers been in stepping up production that now there is plenty for civilian goods, too.

Glycerine is not toxic. Now that real glycerine is back, you don't have to put up with substitutes. Get back to safe, dependable glycerine in your present products. And when you plan new ones you'll want to use glycerine instead of substitutes. Send for the free booklet, "Nothing Takes the Place of Glycerine—1583 Uses For It". Glycerine Producers Association, 295 Madison Avenue, New York 17, N. Y.

Safe against gas—thanks to a cellophane bag—made with glycerine. Glycerine is favored in making cellophane. Since it is non-toxic, it is safe to use in cellophane for all kinds of purposes.



Glycerine and you. If you've been using emergency substitutes, you can now come back to safe, time-tested glycerine in making foods and food products, plastics, paints, textiles, drugs, cosmetics, etc.

DOW PROPYLENE GLYCOL, N.F.

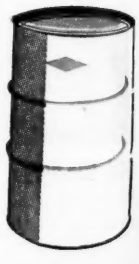
a single versatile material to do several jobs for you

Among the reasons for the rapidly increasing use of Dow Propylene Glycol, N. F. by food manufacturers and processors is its ability to do *more than one job at the same time.* This new Dow product will serve your individual requirements in many ways:

Humectant	Preservative
Solvent	Flavor retainer
Penetrant	Antifermentative
Vehicle	Extraction medium
Mold inhibitor	Antifreeze

But more than this, it will also serve to answer *a combination of these requirements.* For example, Dow Propylene Glycol, N. F. used as a solvent in flavor formulations will likewise act as a vehicle, a preservative and an antifreeze. This multiple-duty feature means real economy, and often results in product improvement as well.

Newly perfected by Dow research, this versatile material is produced to National Formulary standards, under rigid production control. And its clarity, purity and quality are safeguarded during shipment by a new specially lined container. Dow Propylene Glycol, N. F., a slightly viscous, colorless liquid, is readily mixed with water and many other liquids; and its chemical and physical properties give it exceptional value in the processing of many food products. It is now available without government allocation.



PROTECTED PURITY

Detailed information that may well suggest specific profitable application of Dow Propylene Glycol, N. F. in your business is contained in an interesting booklet. Send for your copy, then test this new, improved Dow product.

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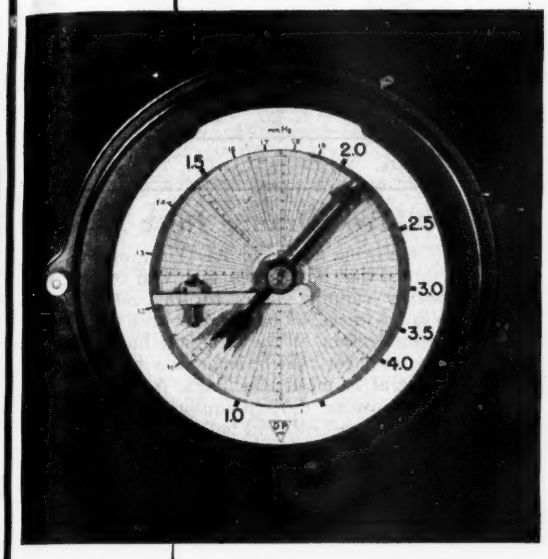

WITH the introduction of its Recording High-Vacuum Gauges, Distillation Products, Inc., continues to provide equipment of modern design for the increasing number of industrial high-vacuum processes.

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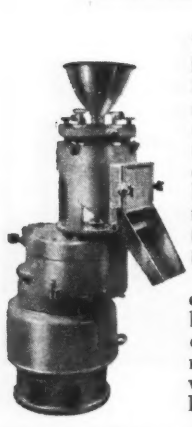
INSIDE NEWS

DECEMBER PREPARED BY NATIONAL CAN CORPORATION, NEW YORK, N. Y. 1944

Colloid Mill Treatment Permits Continuous Homogenizing Process



Paste type mill direct connected to motor

The first colloid mill was introduced into the United States 20 years ago, and since that time continuous improvement has taken place whereby a continuous rather than a batch process is used for the various mixing functions in processing industries.

A colloid mill permits continuous processing in homogenizing, dispersing, disintegrating, grinding, mixing, extracting, as well as emulsifying solids, liquids and pastes.

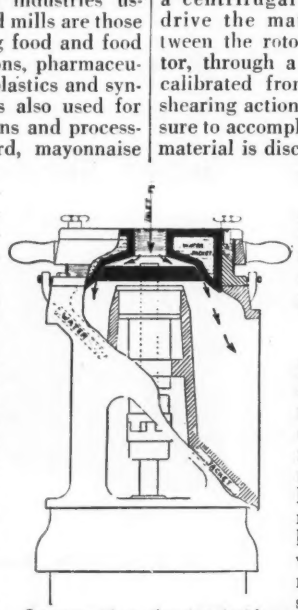
Typical industries using colloid mills are those processing food and food preparations, pharmaceuticals, and chemicals, paints, plastics and synthetic rubber. This method is also used for flavoring extracts and emulsions and processing products such as mustard, mayonnaise and salad dressings.

Superior homogenized products are assured by the uniform distribution of fat globules throughout the mix. Dispersion of solids in liquids, solids in solids, or liquids in liquids results in a more finely divided colloidal suspension and instantaneous chemical reactions. Animal or vegetable tissues can be disintegrated so completely that every particle of fiber or cellulose is instantly exposed to the extractive action of the suspending liquid.

The simplest colloid mill is of vertical design. It allows for gravity feed at inlet and gravity flow at exit. A special device for the accurate centering of the rotor and stator assures the highest operating efficiency at all times. The only moving part is the rotor. Smooth rotor and stator provide longer service under the action of abrasive materials. Abrasive rotors and stators are employed for grinding animal or vegetable tissue or fiber. Also, rotors and stators of stainless steel or other metals are used depending upon the application.

Material flows into the colloid mill by gravity through inlet and comes in contact with high speed rotor. This acts as a centrifugal pump to drive the material between the rotor and stator, through a clearance calibrated from 0.001″ upwards. Hydraulic shearing action eliminates need for high pressure to accomplish the desired dispersion. The material is discharged down the spillway and through the outlet.

High-speed mixer employing colloid mill principle



Cutaway view showing inside of mill

Mills are jacketed for heating or cooling during operation to permit temperature regulation. Operation is simple due to lack of complicated mechanisms.

Mixers

High-speed mixers employing the colloid mill principle of rotor and stator, are used in mixing operations where the continuous single pass treatment is not essential. Solids may be kept suspended in a liquid. The immiscible liquids may be kept from separating by continuous circulation, and viscous emulsions may be mixed or diluted with water or solvents, or for premix preliminary to colloid mill treatment. 821

Illustrations courtesy of Premier Mill Corporation

Oil-free Orange Juice

Oil from the peel has been one of the things that has caused plenty of trouble for citrus canning firms turning out canned orange juice. Not only did its presence hasten deterioration of the product, but it added an off-flavor which made the product distasteful to most consumers. A Florida cannery now has devised equipment for extracting this peel oil, and believes it has entirely licked the problem.

The general practice of packers was to loosen the reaming equipment so as to prevent extraction of much of the oil when the juice was pressed from the oranges. The drawback to this method was that a lot of juice was wasted. With the new de-oiler unit this Florida canner is enabled to tighten down his reamers, and only 2% is lost when the extracted juice passes through the de-oiler.

The de-oiler works on the same principle as a cream separator, removing the oil centrifugally. It was designed originally because of the need for a relatively oil-free orange juice for making citrus concentrate. It worked so well on the concentrate that the packer is using it on his "single strength" orange juice. A sizeable amount is already on the market available to civilian consumers. 824

Citrus Pulp Waste

Two new by-products from citrus pulp waste of citrus canneries are envisioned by one Florida packer—ascorbic acid and edible yeast. Pilot plant operation to extract ascorbic acid was run during the last packing season, and a full scale plant will be in operation to turn it out during the 1944-45 season. A pilot plant will operate next season to turn out the edible yeast which will be used in stock feeds. The yeast will be manufactured from the waste water in the cannery.

The cannery which will manufacture these two new products already turns out a number of by-products from its waste citrus peel. It manufactures essential oils, a citrus molasses and citrus pulp stock feed that has found a ready market for cattle feeding in Florida. 825

Healthy Skin Naturally Antiseptic

Healthy skin has a natural antiseptic action toward many bacteria. Dirty skin, by contrast, shows a sharp reduction in destructive action against bacteria. Moist areas suffer a decline in their sterilizing power. When the skin becomes dry the number of bacteria decrease. A soap with a good lather destroys diphtheria bacilli, streptococci, pneumococci, meningococci, gonococci, influenza bacilli and Eroponema pallidum. The alkalinity of the soap is not responsible for the bactericidal action, this being due rather to the undissociated fatty acid molecule. 826

Packing Cream-style Corn

A new method of packing cream-style corn without the use of commercial cornstarch has been developed by a large midwestern cannery firm. It involves the use of special disintegrating equipment to make a high starch cream from mature corn which is added to the cream-style pack to bring it to proper consistence. 822

Clay Soil Paint Pigment

A paint pigment has been prepared from the clay soils of Puerto Rico. After treatment for 6-8 hours the resulting compound gave a paint ready for use on thinning with linseed oil. Preliminary tests indicated that this paint would be satisfactory as a general outside paint for roofs, barns, boats and machinery. 823

NATIONAL CAN

PLANTS: NEW YORK • BOSTON • BALTIMORE • CHICAGO • HAMILTON, OHIO • FORT WAYNE, INDIANA

Small Insecticide Dispensers

Small aerosol insecticide dispensers—miniature metal cylinders about two inches long, carrying one-shot doses of insect gas for spraying small confined areas, may be put on the market after the war. They would be similar in design and appearance to the small carbon dioxide cylinders sold for home preparation of carbonated waters, and would be convenient for taking along on week-end trips to provide protection from insects. 827

Dental Coating

A protective coating, of interest in dental preparations as a means of treating ailments of the oral cavity, offers possibilities to manufacturers of tooth pastes, etc., and other dental preparations. The method concerns itself with the use of a protective coating material formed by combining in a solid edible matrix such as sugar particles or a pectous substance such as pectin or a pectate or pectinate, dispersed throughout the mass. The matrix will dissolve slowly in the mouth, gradually exposing the pectous particles which, as they come to the surface, form a coating. 828

Frozen Concentrated Milk

A new method for manufacturing frozen concentrated milk is being investigated by the armed forces as a possible source of fluid milk for hospital ships. The product may be one that has commercial postwar possibilities for the domestic consumer market. Developed by research workers at a state college, the new product is said to be superior to evaporated milk. Taste tests indicate that the product, when reconstituted, can hardly be distinguished from fresh milk. It can be defrosted by putting the frozen blocks directly into hot water. By using an equal amount of water, a product resembling coffee cream is produced. Twice as much water is added for beverage purposes. 829

Mechanical Corn Pickers

Corn canners soon may be owning mechanical corn pickers to lend to their growers for harvesting cannery sweet corn. Enough experimenting has been done already so that it is known that the machines will work satisfactorily. Experiments were made by one large canning concern last season to learn what adjustments needed to be made to the conventional style of corn picker which is used to harvest mature field corn. This season, a dozen of the pickers worked successfully on white corn and the taller growing strains of yellow corn.

It is reported that one man, driving a tractor-mounted picker, can harvest 10 to 12 acres per day of white corn running around three and a half tons to the acre. This is equivalent to the labor of eight or nine men picking by hand. 830

Technical Topics

CHOCOLATE TREATMENT—The old chocolate conche, with its huge bed and heavy stone roller, took from 72 to 120 hours to grind, aerate and blend the cocoa, cocoa butter and sugar into a smooth paste. Through a careful study of the various functions of this cumbersome old apparatus a machine has now been designed which accomplishes all the desired results in from 8 to 24 hours. It is even claimed that the chocolate paste produced on the new equipment is better than that of the old conche in labor and in simplicity. 831

CERAMIC COMPOSITION—Electrically conductive coatings of a ceramic type composition can now be used on a wide variety of non-conductors including glass, plastics, porcelain, soapstone, wood, cloth and paper. Different formulations of the material are being produced to meet varying requirements of different base materials and degrees of adherence and film toughness. Coatings are dull, metallic gray in appearance. 832

SHOE COATING—Shoes coated with a solution of vinyl resin are reported to protect the wearer against allergy, dermatitis and folliculitis caused by oils and solvents. The solution is said to be impervious to sulphur-base cutting oils, kerosene, paint, lacquer, cleaning and degreasing compounds and other organic solvents and leave the leather flexible. It will protect and greatly extend the life of shoes. 833

LARVAE CONTROL TESTS—Toxicity tests of phenothiazin insecticidal sprays and dusts for control of larvae of the codling moth showed that the addition of bentonite or slaked lime decreased the effectiveness. 834

WATER SOFTENER—Sodium alginate is advanced as a water softener and remover of boiler scale. These properties are attributed to the fact that, combined with calcium, it forms an insoluble globular mass which envelops other precipitates and sediment to give a soft, pasty sludge that is removable by regular blowdown or swilling. 835

INSECT REPELLENT—Dimethyl phthalate has been found far superior to Citronella and other preparations as an insect repellent. Now on allocation, it will be a great advance in repelling mosquitos, fleas, flies, gnats and chiggers. 836

MOSQUITO LARVAE KILLER—Paris green (copper aceto-arsenate) has been found so toxic to mosquito larvae that less than one ten-millionth of a grain can destroy a larva. This new application is being widely used in the South Pacific and in Italy. 837

SILVER STERILIZES WATER—Interesting results in the use of silver for sterilization of potable water have been found by the Indian Tea Association. This process has been in use at 40 labor camps in India. No taint is imparted to the water. In this respect it is superior to chlorination and continual tests show satisfactory bacterial control. 838

POLYTHENE—Polythene plastic applied by the flame-spraying of metals method is tough and highly impermeable, and when applied over metal surfaces provides a high degree of protection against brines, chemicals, and other corrosive agents. 839

PRESERVATION OF DESICCATED BLOOD-GROUPING SERA—The preservation of desiccated blood grouping sera has been effected by diluting with such dried powdered substances as sucrose, dextrose, sodium chloride, or other non-hygroscopic salts which do not affect agglutination. 840

RESINOIDS—Natural extractions such as resinoids from storax, Peru balsam, benzoin and oakmoss are necessary as fixatives and aromatics in the use of lavender odors in all powders for the cosmetic industry. 841

CHEMICAL GERMICIDES FOR RINSING DISHES—A laboratory method for the evaluation of the efficiency of chemical germicides used for rinsing hand-washed dishes is in process of development. After sufficient progress has been made with this method, it is hoped to extend the project to the field of machine-washed dishes. 842

REPELS JAPANESE BEETLES—A satisfactory repellent for Japanese beetles consists of Bordeaux mixture (4-4-50) with lead arsenate. 843

Every effort will be made to furnish additional information on these articles. Where such information is not obtainable, we will refer inquiries to the original source of the article. Write to National Can Corporation, 110 East 42nd Street, New York City. Please mention the number at end of article—also name of the magazine you saw it in.

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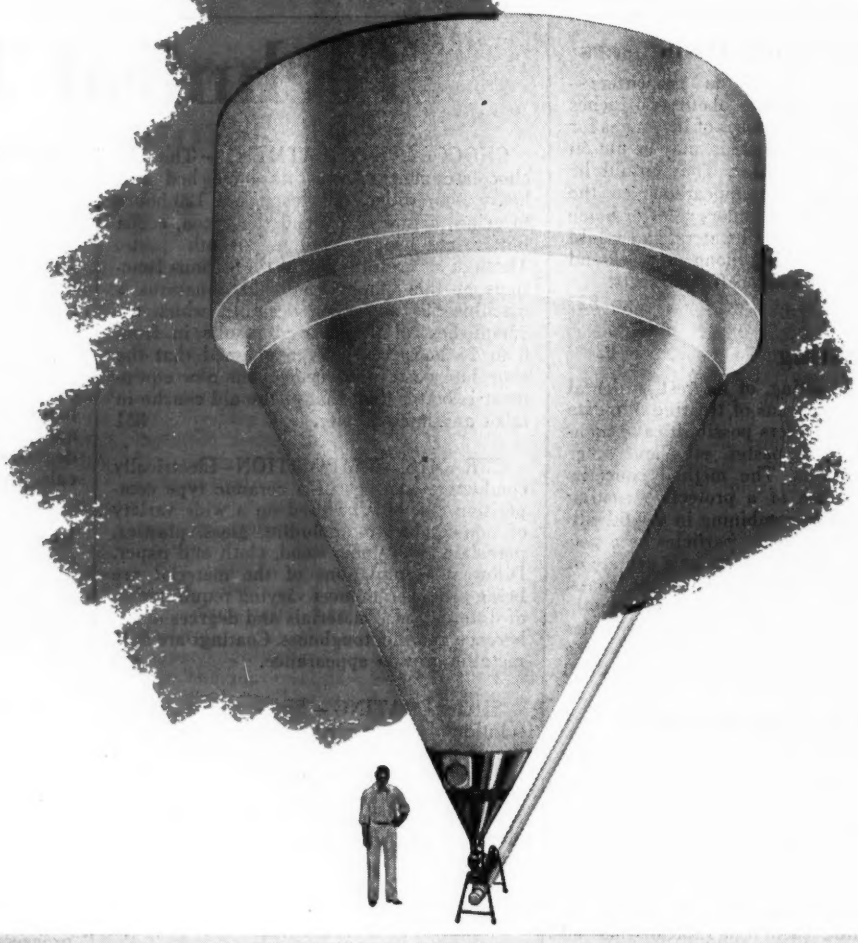
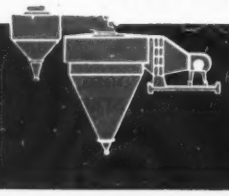
Why Spray Dried foods are more profitable when produced by the Douthitt Gray-Jensen Process



Some of the foods dried by the Douthitt Gray-Jensen Spray Process:

- Whole milk
- Skim milk
- Ice cream mix
- Buttermilk
- Chocolate milk
- Infants' foods
- Pectin
- Eggs
- Malt extract
- Yeast
- Vegetable juices



DRIED FOODS produced by this process are of uniform texture and fineness. They retain full flavor with maximum nutrient and vitamin values. Their high quality commands top market prices.

The Douthitt Gray-Jensen Spray Drying Process converts food from liquid to powder in less than 30 seconds. It operates with 15% to 50% less fuel . . . requires less manpower to operate. The total cost per pound of product averages 10% to 15% lower.

Investigate the possibilities of Douthitt Gray-Jensen Spray Dryers for your plant. Write for information.

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View in a corner of a Paisley Laboratory showing use of quinhydrone type PH meter for a Potentiometric Titration

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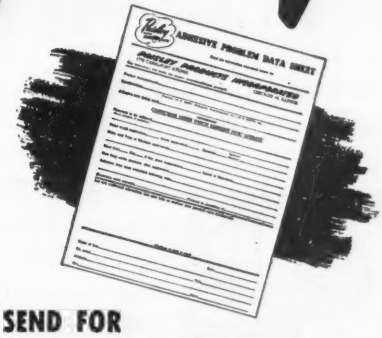

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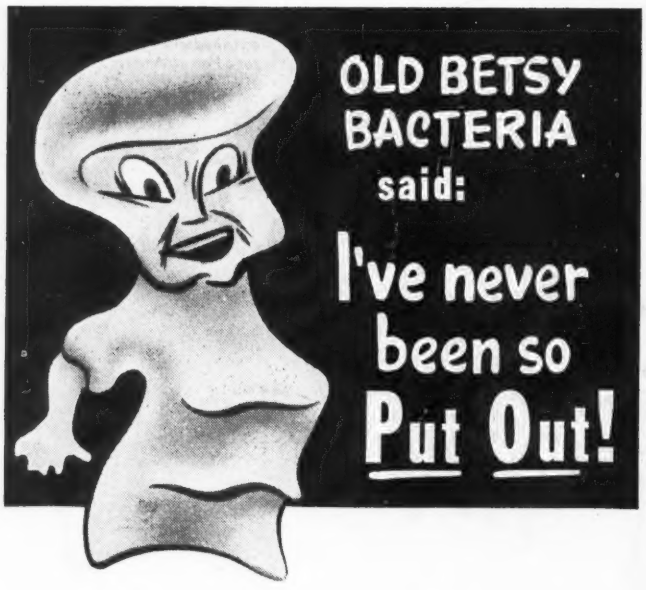

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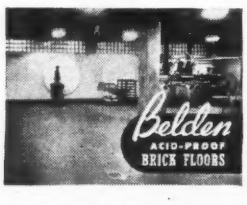

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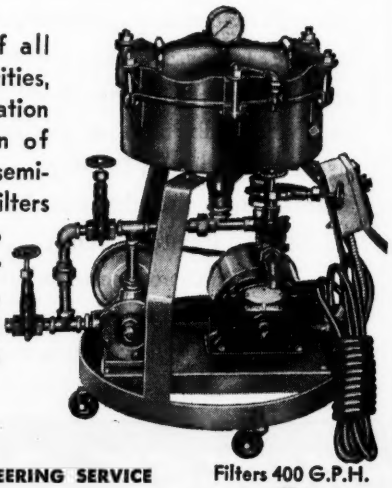

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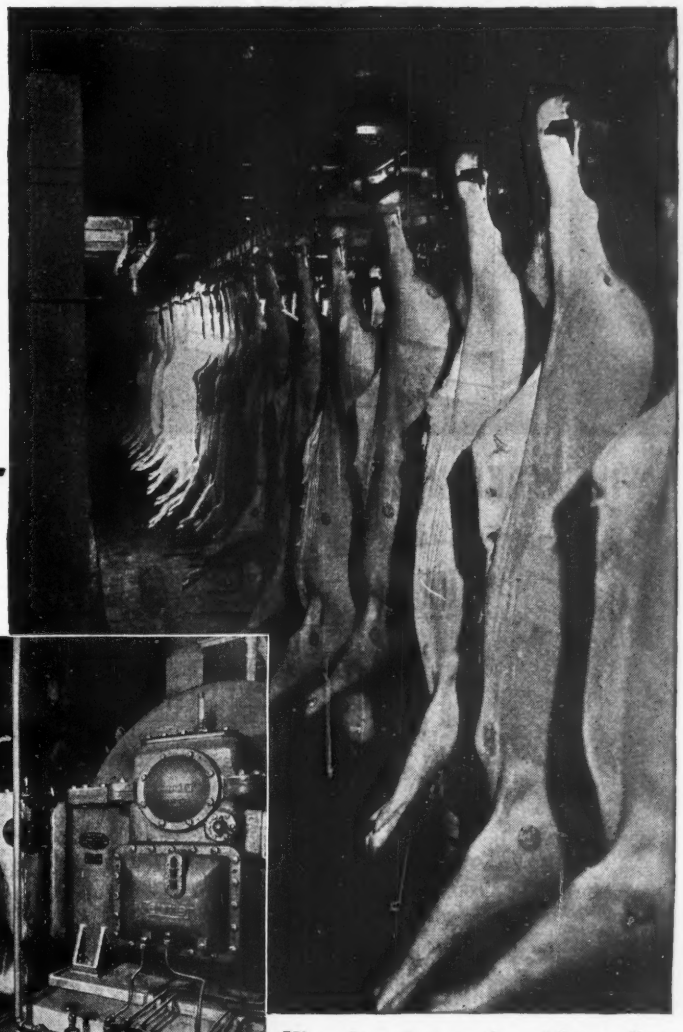

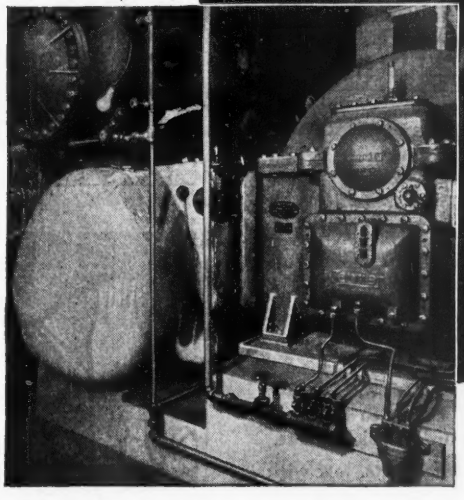

View above shows section of hog cooling room in plant of Agar Packing and Provision Corporation. At left: compact Carrier centrifugal refrigerating machine.

HOW A progressive meat packing concern solved a refrigeration problem is well illustrated in the plant of the Agar Packing and Provision Corporation of Chicago.

Need existed for additional refrigeration to maintain low temperatures necessary for rapid and continuous production during hog-chilling operations. Only relatively small space was available for the purpose.

To meet requirements under existing conditions, a compact Carrier Centrifugal Refrigerating Machine was installed. Composed of four elements—compressor, condenser, brine cooler and a 550-h.p. steam turbine—the entire unit covers an area only 12′ x 16′ . . . ideally suited to the needs of the average slaughter house.

"Freon" safe refrigerants are used exclusively by the Agar Corporation. In speaking of this, J. J. Hewitt, Purch. Agent, writes: "During the last 14 months' operation in which we have had the Carrier machine in use, we have had no gas loss. Our engineers like to work with it due to its simple operation and safety features. By use of 'Freon,' we can maintain constant temperatures 24 hours a day regardless of load variations."

Whenever the need arises in your plant for new or additional refrigeration or air conditioning . . . or if you are planning postwar improvements along these lines . . . consult your architect or air conditioning engineer. They will gladly recommend dependable equipment. And to assure yourself of the advantages and safeness of "Freon" ask that specifications call for compressors designed to utilize "Freon," safe refrigerants. Kinetic Chemicals, Inc., Tenth and Market Sts., Wilmington, Del.

"Freon" safe refrigerants are widely used in heavy-duty refrigeration and air conditioning systems

KINETIC

FREON *safe refrigerants*

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"Freon" is Kinetic's registered trade mark for its fluorine refrigerants.

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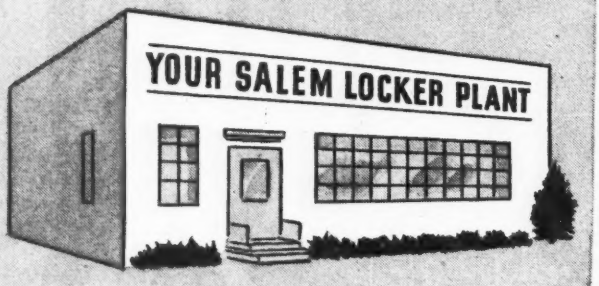

More than 3,000,000 people now enjoy the benefits of frozen foods through community locker plants.

As home freezers come into use after the war, millions more will become conscious of the profitable advantages of the community locker plant and frozen foods.

For instance, few persons will want to fuss with processing tribulations. It will be much easier to arrange for the processing through the community locker plant.

Of the thousands who will buy home units, few will want to invest in a sub-zero box for freezing. They will prefer a holding temperature box. Neither will they want to buy a huge unit, sufficient for storing several hundred pounds of food. They will want to store small quantities from their own gardens.

All of which adds up to thousands of home freezer sales and thousands of new customers for the locker plants. As a result, the community locker plant, as well as the home unit manufacturer, will benefit.

Salem builds automatic and walk-in types of locker plants.

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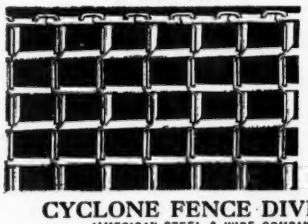
HUNDREDS of manufacturers—including many food processors—have found that Cyclone Metal Conveyor Belts last far longer under the punishment of water, steam and temperature changes than belts of other materials. They have found, too, that Cyclone Belts cut servicing time and labor, speed production and boost output—that they are strong, flexible, porous, long-lasting, clean. It will pay you to specify "Cyclone" when ordering metal conveyor belts.

Made in many widths, weights and mesh sizes—Chain Link and Flat Wire types. Write for detailed information and prices. No obligation.

Flat Wire Belt



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I'M GOING TO HIT A SAFE HOLE BIG ENOUGH TO HANG MY XMAS SOCK
NO SOAP, COCKY, THE ONLY SOCK YOU'LL GET WILL BE FILLED WITH TANGLEFOOT VICTORY DIFUSOR LIQUID

Cocky is right. No crack or crevice is deep enough to harbor cockroaches or other insect pests when they're subjected to a dose of the powerful TANGLEFOOT DIFUSOR LIQUID — the only safe wartime alternate for genuine DIFUSO. Used with a TANGLEFOOT DIFUSOR or power sprayer — if you're lucky enough to have one — you'll find TDL instantaneous and the most effective pest exterminator you've ever used. Dealers name on request.

TANGLEFOOT
VICTORY·DIFUSOR·LIQUID

THE ONLY ALTERNATE FOR GENUINE *DIFUSO* WHICH CAN BE SAFELY USED IN THE NOW IRREPLACEABLE *DIFUSOR*

THE TANGLEFOOT COMPANY
316 Straight St., S.W., Grand Rapids, Mich.

UNDERWEAR IS IMPORTANT IN PACKAGING, TOO . . .

Today's foods are *completely* dressed, even to underwear. Consider Betner's liners, for example, worn "next to the skin" of America's *finest* foods!

BETNER'S LINERS

1. Suitable for any hygroscopic food
2. Thermosealed with minimum equipment
3. Prevent leakage, seepage
4. Prevent flavor loss
5. Moisture- vapor-proof
6. Low in cost

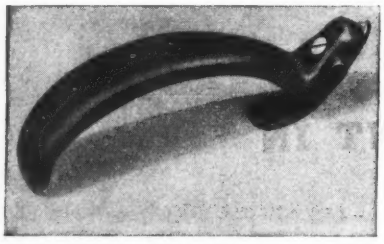
Best proof of Betner quality is the list of processors who use Betner service. For some we supply the complete package . . . inner and outer bags. For others, liners only. Betner's is a complete *bag* service . . . we turned out over 4 *billion* bags last year. And every bag—you could choose any, at random—would be proof of the painstaking care with which we operate.

Why not entrust us with your packaging problem? Our designers and research technicians will willingly study your requirements, offer suggestions which will obligate you in no way. Our main office is in Devon, Pa., and we're at your service the moment a letter or phone call reaches us.

Benj C Betner Co

DEVON, PA.

To Conserve Shipping Containers

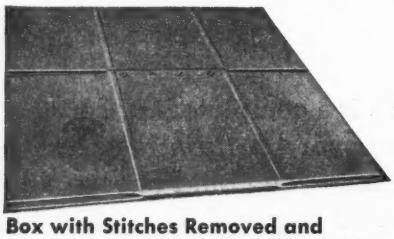


WIRE STITCH REMOVER
Price $1.60 Postpaid

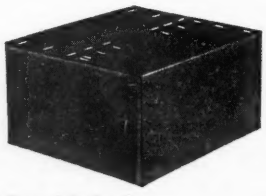
The Containers Branch of the War Production Board has ruled in favor of re-use of Wire Stitched Shipping Containers, to conserve corrugated and solid fibre board.

Regular slotted containers that are both bottom and top stitched, when emptied, may now be knocked down by removing the wire stitches, flattening the boxes as illustrated here, and returning them in bundles to the original packer.

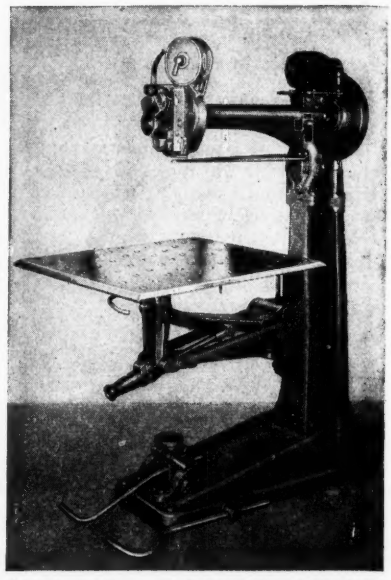
This wire stitch remover is a handy, practical tool for quickly removing the wire stitches without breaking or tearing the board. It will materially reduce the time and cost of preparing wire stitched containers for their return trip for re-use. *Send orders to New York Office.*



Box with Stitches Removed and Flattened for Return Trip



Box Stitched Top and Bottom

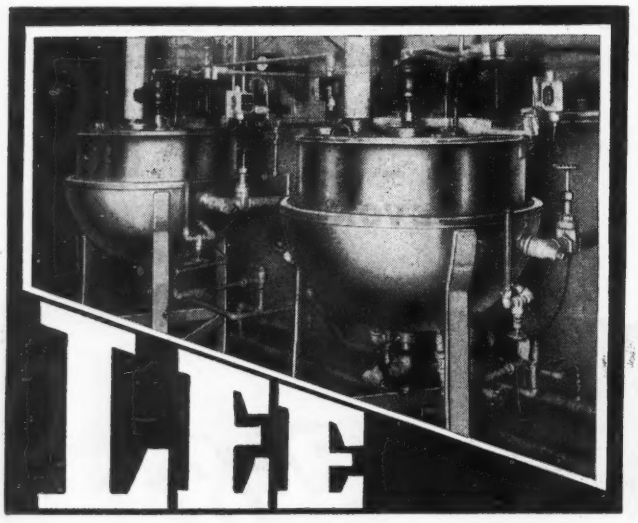


BLISS TOP and BOTTOM STITCHER
For assembling cases, the blade anvil is lowered, table is swung to one side, and post placed in position for bottom stitching. For top stitching, the post is removed and blade anvil and table swung into position. Change is made in less than one minute.

DEXTER FOLDER COMPANY

330 West 42nd Street, New York 18, N. Y.

CHICAGO, ILL. • PHILADELPHIA, PA. • CINCINNATI, OHIO



Engineering "KNOW-HOW"
MEANS BETTER, MORE DEPENDABLE
PROCESSING KETTLES

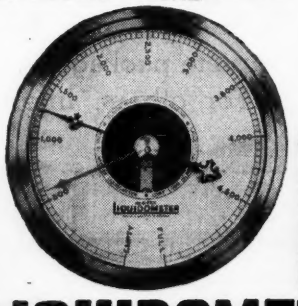
PROMPT DELIVERIES

Standardization of production methods and engineering "KNOW-HOW" have resulted in low initial costs for LEE equipment—used successfully in every industry. Whether you need standard or special type kettles—LEE can fulfill your exacting requirements. Catalog on request.

LEE
METAL PRODUCTS CO., INC.
416 Pine Street • Phillipsburg, Penna.

BUILDS STANDARD OR UNUSUAL PROCESSING EQUIPMENT

THOSE WHO CAN'T AFFORD TO MAKE ERRORS IN MEASURING VALUABLE STORED LIQUIDS CHOOSE—



LIQUIDOMETER *Tank Gauges*
"THEY'RE ALWAYS DEPENDABLE"

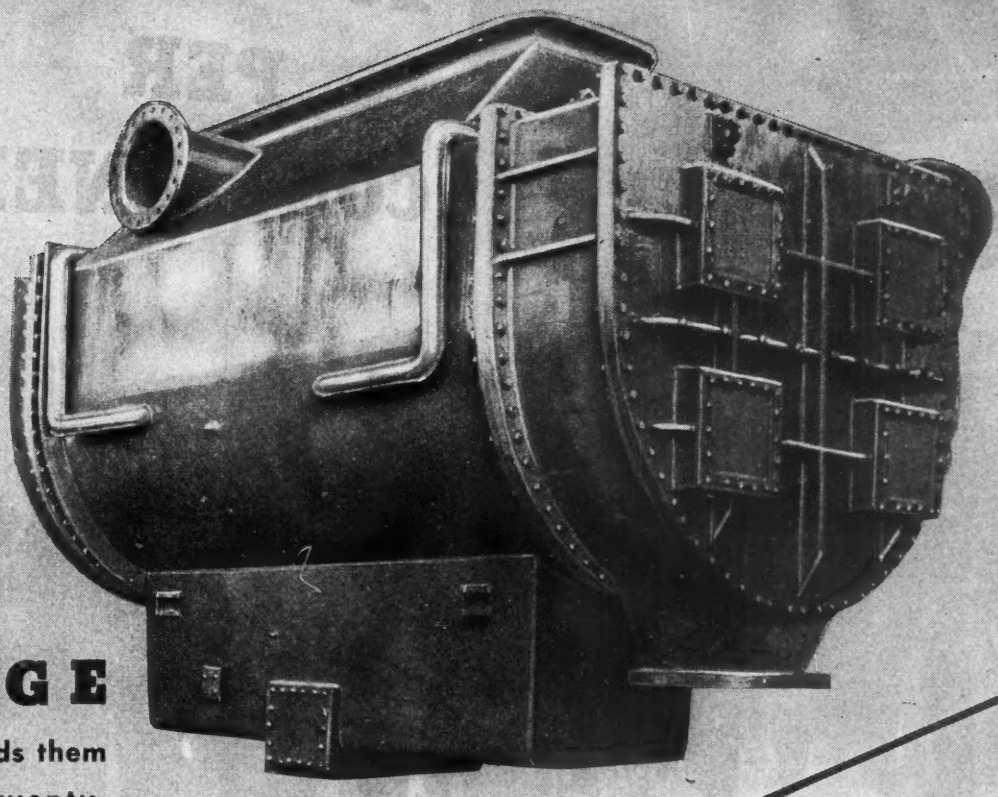
100% automatic.
No pumps, valves, or auxiliary units needed to read them.
Models available for either remote or direct readings.
Accuracy unaffected by specific gravity of tank liquid.
Approved by Underwriters' Laboratories for gauging hazardous liquids.

Write for complete details.

THE LIQUIDOMETER CORP.
38-14 SKILLMAN AVE., LONG ISLAND CITY, L.N.Y.

HEAT TRANSFER EQUIPMENT

CONDENSERS • STEAM EJECTORS • EVAPORATORS • HEAT EXCHANGERS

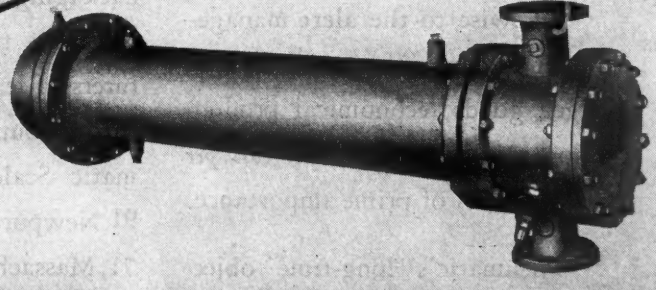


LARGE

Graham builds them big! Ten, twenty, thirty, fifty thousand square foot condensers are all made to order in our Oswego works.

SMALL

No unit is too small for painstaking Graham craftsmanship. Our Batavia plant is experienced in this work.



AWARDED THE MARITIME "M" PENNANT AND VICTORY FLEET FLAG APRIL 8, 1944

GRAHAM MANUFACTURING CO., INC.

415 LEXINGTON AVENUE • NEW YORK 17, N. Y.

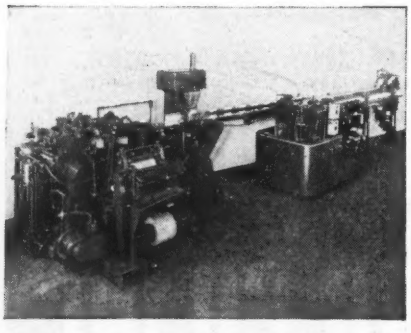
LOWER COST PER CONTAINER

SLOGAN of Importance to 135,000,000 AMERICANS

When automatic Pneumatic Machinery reduces the packaging cost of products running to millions of packages annually, this has a most favorable effect on millions of American homes.

Likewise to the alert management of a manufacturer of packaged goods, economical production resulting from *lower cost per container*, is of prime importance.

Pneumatic's long-time objective is, and always has been, improved packages and higher machine efficiency. THAT IS WHY, today as in peace time, Pneumatic Packaging & Bottling Equipment continues to serve the manufacturers of leading national brands throughout the country.—Pneumatic Scale Corporation, Ltd., 91 Newport Ave., North Quincy 71, Massachusetts. Branch Offices: New York 6, Chicago 1, San Francisco 11, Los Angeles 13.



One of Pneumatic's outstanding machine hook-ups in that it produces a filled and securely sealed 'package within a package' at speeds ranging from 60 to 70 packages per minute.

PNEUMATIC

PACKAGING & BOTTLING MACHINERY

Take a Tip from the ANCIENT WARRIOR

He carried only one shield. That was his defense against enemy attack. By *placing it right,* that one shield was enough. That's the way with your plant equipment.

On most jobs you need Stainless Steel only on the exposed surface side.

INGACLAD
STAINLESS-CLAD STEEL

has for 12 years proved its protective efficiency in hundreds of America's finest industrial plants. In addition to stretching your "Stainless Dollars," it offers the additional advantages of easier fabrication and better heat diffusion in kettles and other vessels where heat is applied.

Write for special IngAclad folder and Manual of Fabricating and Welding Procedure.

INGERSOLL STEEL & DISC DIVISION
BORG-WARNER CORPORATION
310 South Michigan Ave., Chicago, Illinois
Plants: Chicago, Ill. • New Castle, Ind. • Kalamazoo, Mich.

Users of IngAclad include:

Angelus-Campfire Co.
Armour & Co.
Campbell Soup Co.
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Corn Products Refining Co.
Fleischmann Co.
General Foods Corp.
Kraft-Phenix Cheese Co.
Libby, McNeill & Libby
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Quaker Oats Co. (Canada)
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PRODUCTS OF BORG-WARNER

NEW WAY CASERS

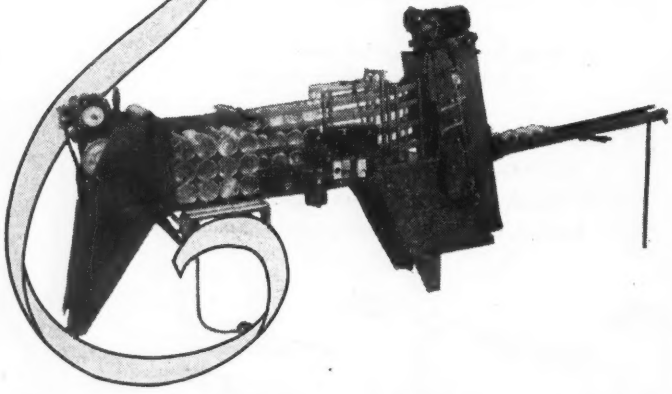
EQUIPMENT BY CRCO

Built To Fill Every Need For High Speed Casing

Single-Tier and Double-Tier Casers that will operate at high speed without mechanical troubles. Every New Way Caser is precision built to give years of satisfactory service.

When you are planning your line, let New Way engineers make recommendations covering labeling and casing. Then you will have equipment you can depend on—labelers and casers that will meet any speed requirement.

Consult Your Nearest CRCO Representative or Write Direct



NEW WAY DIVISION

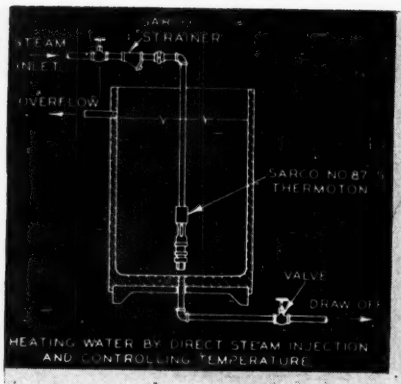
HANOVER, PA.

THE BEST OF Everything

CHISHOLM-RYDER CO. INC.

Niagara Falls, New York

FOR THE FOOD PROCESSOR



WATER HEATER *and* TEMPERATURE CONTROL IN ONE

Sarco type 87-S Thermoton combines a silent steam injector with automatic temperature control in one inexpensive unit, easy to install.

Suitable for cleaning or rinsing tanks in metal finishing shops or wherever small quantities of water are heated by direct steam injection. Ask for Catalog No. 550.

No. 87-S

SARCO SARCO COMPANY, INC.
475 Fifth Avenue, New York 17, N. Y.
SAVES STEAM SARCO CANADA LTD., 85 Richmond St. W. TORONTO, ONT.
175

Give your product

EXTRA VALUE

THIS EASY WAY!

TO MAINTAIN sales today, in competition with modern, nutritionally improved foods, your product must be kept up-to-date.

By adding extra vitamins and minerals you may do more than increase food values—may add *extra sales vigor*.

WINTHROP'S specialized vitamin and mineral preparations are designed to keep such improvement easy, economical. For specific information, consult our TECHNICAL SALES SERVICE—no cost or obligation. Price schedules sent on request.

WINTHROP VITAMINS and VITAMIN-MINERAL CONCENTRATES

Crystalline **VITAMIN B_1** (Thiamine Hydrochloride)

VITAMIN B_2 (Riboflavin)

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Crystalline **VITAMIN C** (Ascorbic Acid)

d-iso-ASCORBIC ACID

CALCIUM PANTOTHENATE

"8-E-T-S" (Winthrop's brand of bread-enrichment tablets)

"VEXTRAM" (Winthrop's brand of flour-enrichment mixture)

Riboflavin Concentrates:

RIBOFLAVIN BOOSTERS for bread

WINTHROP RIBOFLAVIN MIXTURE for mixed feeds

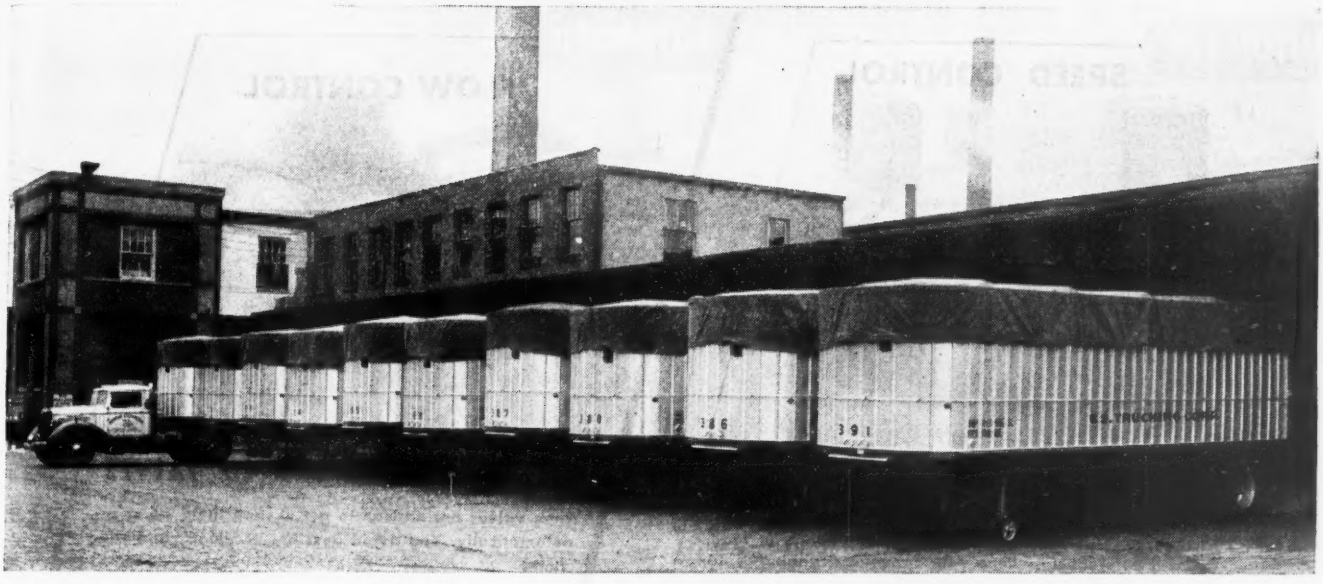
WINTHROP

Address inquiries to—
Special Markets Division
WINTHROP CHEMICAL COMPANY, INC.
170 VARICK STREET, NEW YORK 13, N. Y.

ARMY E NAVY

U. S. Trucking Corporation advises:

ONE tractor keeps 4 to 5 trailers in use



● Here is one of the thousands of home-front trailer transport jobs . . . and one of the many U. S. Trucking freight transfer operations by trailer . . . that move goods with *flexible* efficiency!

FROM terminals in New York City and adjacent territory, U. S. Trucking Corporation, carloading companies and other carriers transfer to local piers and other terminals general merchandise for consolidated cars forwarded via rail facilities.

Freight must be handled swiftly, flexibly, economically from congested piers and terminals. A fleet of U. S. Trucking trailers helps fill the bill!

One tractor keeps 4 to 5 trailers in use—being loaded, transferred or unloaded. From one pier or terminal it rushes each freshly loaded trailer to another terminal or pier for railroad carloading, picks up a freshly emptied trailer and returns it for reloading—then repeats this process.

This tractor-trailer transfer thus involves the operating cost of only *one motor, one driver*—as compared with 4 to 5 motors and drivers required otherwise.

Lapeer type Trailmobiles, with automatic coupling and uncoupling, help to speed the operation. In the metropolitan New York area, U. S. Trucking Corporation keeps about 140 trailers busy, of which around 100 are Trailmobiles.

Use Service Centers...and keep your present equipment rolling. Use Trailmobile Service Centers—52 of them, strategically located. Send for list.

The Trailmobile Company

Cincinnati 9, Ohio — Berkeley 2, California

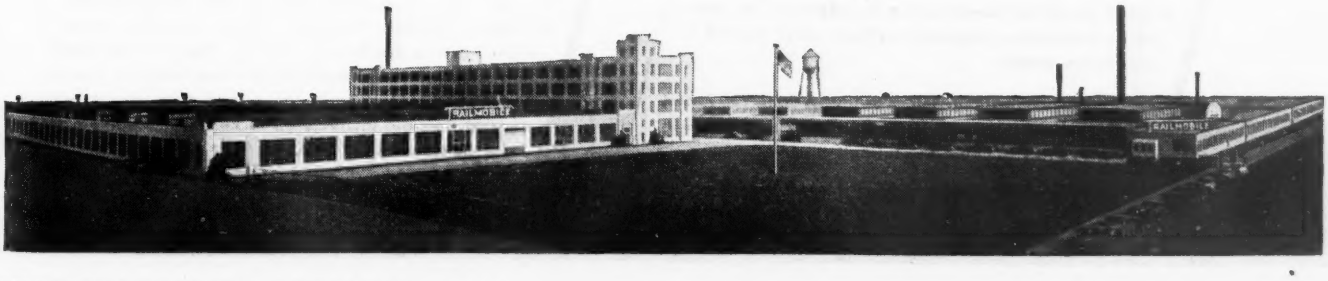
NEW TRAILMOBILES AVAILABLE!

Pictured here is the headquarters plant of The Trailmobile Company—the spacious, streamlined factory where under ideal working conditions, an army of highly-skilled technicians and mechanics produce an endless stream of trailers.

As in the first World War, The Trailmobile Company has been honored in this second war with the "E" for excellence flag. Now, Government allocations permit the manufacture of Trailmobiles for commercial use. See your Trailmobile distributor for new Trailmobiles!

TRAILMOBILE

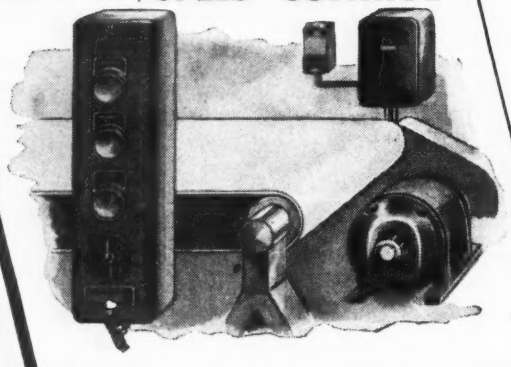
Commercial Trailers for War and Peace
The Vital Link in Flexible Transportation



TO BOOST OUTPUT

AUTOMATIC

SPEED CONTROL



G-E THY-MO-TROL DRIVE

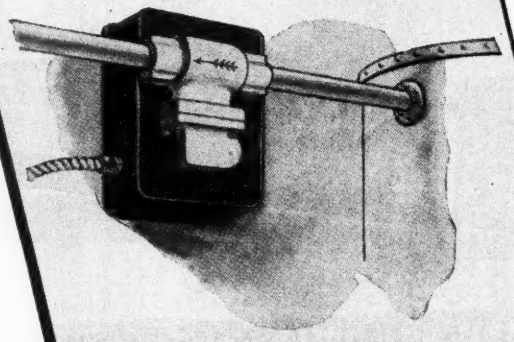
Here's an electronically operated "speed cop" that, regardless of ordinary fluctuations of voltage or load, will automatically keep your conveyors running within the speed limits you want maintained.

A push-button station, which can be located within easy reach, is the control point for starting, stopping, and regulating speed of conveyors or other continuous-running equipment.

G-E Thy-mo-trol drives are available in sizes up to 20 hp. Ask for Bulletin GEA-4025, "Adjustable Speed Electronically."

AUTOMATIC

FLOW CONTROL



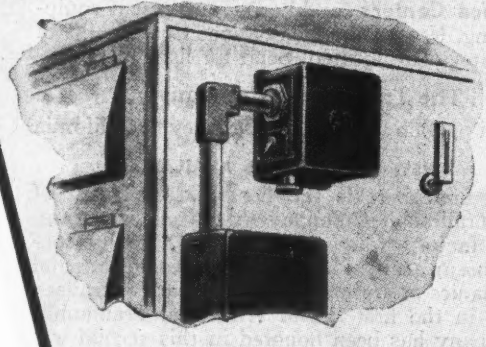
G-E SOLENOID-OPERATED VALVES

When valves are difficult to get at, turn them off or on automatically. You avoid possible accidents, and save time.

With G-E solenoid-operated valves, an accessible push-button station permits remote control of oil, or gas to ovens, water to cooling jackets, or even of air whistles. With valve bodies of bronze, cast iron, monel metal, or cast steel, and sizes up to 2 in., G-E solenoid-operated valves have a wide variety of service applications. Ask for Bulletin GEA-1423A.

AUTOMATIC

TEMPERATURE CONTROL



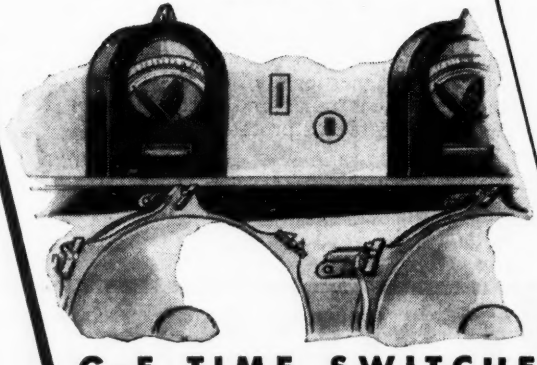
G-E THERMOSTATS

For cooking, baking, chilling—any process needing heat or cold—automatic temperature control can help lick the man-power problem. Not only do G-E thermostats avoid the human errors in judgment, but their precise temperature regulation affords close control of production quality.

Available in adjustable ranges as low as 30 to 120 F, and as high as 500 to 750 F. Current capacity is 25 amperes, a-c, 115 to 230 volts. Ask for Bulletin GEA-1265.

AUTOMATIC

TIMING



G-E TIME SWITCHES

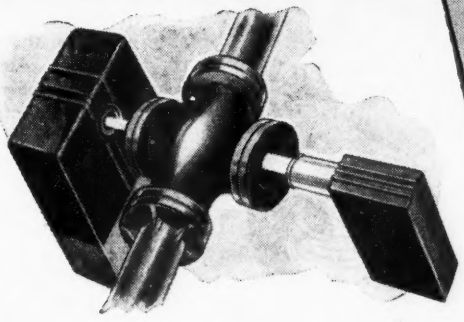
You'll gain valuable time, and freedom from worry over possible material spoilage, by the simple expedient of installing a G-E automatic "clock-watcher."

Time on, time off, and time out are three strikes called by these electrical "umpires." They eliminate uncertainties due to the human element. You can start and end operations automatically, the time intervals can be seconds, minutes, hours, days, and even weeks, with preset time-out intervals up to 24 hours' duration. Ask for Bulletin GEA-1771B.

MAKE YOUR FOOD PLANT MORE AUTOMATIC

AUTOMATIC

Detecting, Measuring, Counting, Sorting



G-E PHOTOELECTRIC RELAYS

You can automatically open and shut doors, regulate, count, sort, inspect, and weigh; measure material movement, or "watch" moving liquids for color change or impurities, by using simple applications of modern G-E "electric eyes."

Highlighting the field of automatic controls, the "electric eye" method finds broad application in the food industry. Immune to fatigue, eyestrain, or temperamental idiosyncrasies, it brings an unerring certainty of performance which insures constant, uniform production.

When conditions require it, G.E. can furnish photoelectric relays that will respond to a shadow or light flash of 1/1000 second. G-E photoelectric relays are often used in conjunction with G-E electronic timers to provide automatic processing with a range of time interval from 0.045 to 140 seconds.

There are many types of G-E photoelectric relays, light sources, and accessories. Technical data is available. Bulletins GEA-1755A and GEA-3533.

Buy all the BONDS you can —and keep all you buy

PREPARING PROCESSING PACKAGING

PEAK-LOAD FOOD PRODUCTION won't end with the fighting, and it's sure to become *more competitive.* To keep up your volume, yet lower your processing costs, you'll need new ways to multiply man-hours.

In the average plant almost every operation can be made *more automatic* by the application of electric and electronic means for timing, speed control, flow regulation, and inspection. And today, the chances are much brighter for prompt delivery, to you or to the machine manufacturer whose products you intend to buy.

G.E. can assist you with competent engineering help not only in your planning to convert to automatic methods, but also in the over-all modernizing of electric equipment, from entrance cable right through to individual motor drives and controls.

Why not, right now, start the ball rolling for a friendly, informative discussion with our food processing specialists? There's no obligation. There's much to gain. *General Electric Company, Schenectady 5, N. Y.*

So that you will know the many G-E man-hour multipliers, mail the coupon for our new 24-page catalog—"Electric Equipment for the Food Industry." It describes the wide assortment of G-E motors, controls and other devices G.E. has available to help you go automatic.

General Electric Company, Sec. 653-11, Schenectady 5, N. Y.

I'm for automatic controls. Let's see more of what you have to multiply my man-hours. Send your new catalog (GEA-4322). Also, please send me.....

Name.....

Company.....

Address.....

City..... State.....

110

GENERAL ELECTRIC

Why leading Refrigeration Engineers prefer Johns-Manville ROCK CORK

Here are a few of the outstanding reasons why Johns-Manville Rock Cork is specified by so many leading refrigeration engineers:

BASICALLY MINERAL—Rock Cork is made of mineral wool with a waterproof asphaltic binder.

RESISTS MOISTURE ABSORPTION—Rock Cork is thoroughly sealed against air and moisture infiltration, thus eliminating the direct cause of most insulation failures.

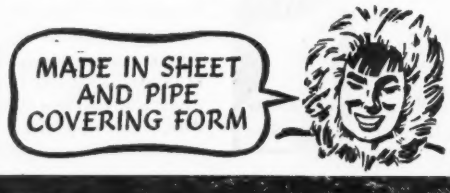
SANITARY—Rock Cork will not harbor vermin, and cannot support the growth of mold or bacteria.

LOW CONDUCTIVITY—Rock Cork's rating is less than 0.33 Btu per sq. ft. per deg. F. temperature difference per in. thick, per hour at mean temperature below 100° F.

TIGHT JOINTS—This unique advantage of Rock Cork is made possible by the fibrous nature of the material.

STRUCTURALLY STRONG—Rock Cork may be handled without danger of breakage. Yet, it may be sawed and worked with ease on the job.

Rock Cork has proved successful through years of service. Many installations are still effective today even after 35 years' use. For more facts, write for brochure DS-555, Johns-Manville, 22 East 40th Street, New York 16, N. Y.



JM Johns-Manville
ROCK CORK

Filma-Seal
CAP AND SEAL APPLIED AS ONE

With milk fortifiers or other glassed products maintaining quality depends on the way those products react on the dealer's shelves. Moisture or air ingress, leakage, store sampling or tampering may ruin your product and reputation at the same time. Check Filma-Seal* . . . the cap with the inner seal that provides *double* protection – double safety. Cap and seal are applied as *one.*

FERDINAND Gutmann & COMPANY
SINCE 1890
*Reg. U. S. Pat. Off. and abroad
3603 14th AVENUE • BROOKLYN, N. Y.

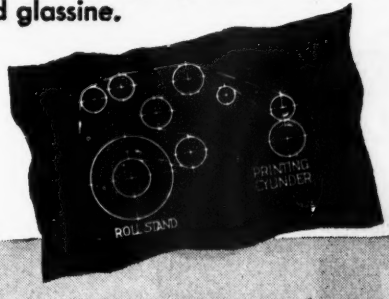
A PROGRESSIVE POLICY *combined with a* TRADITION OF QUALITY

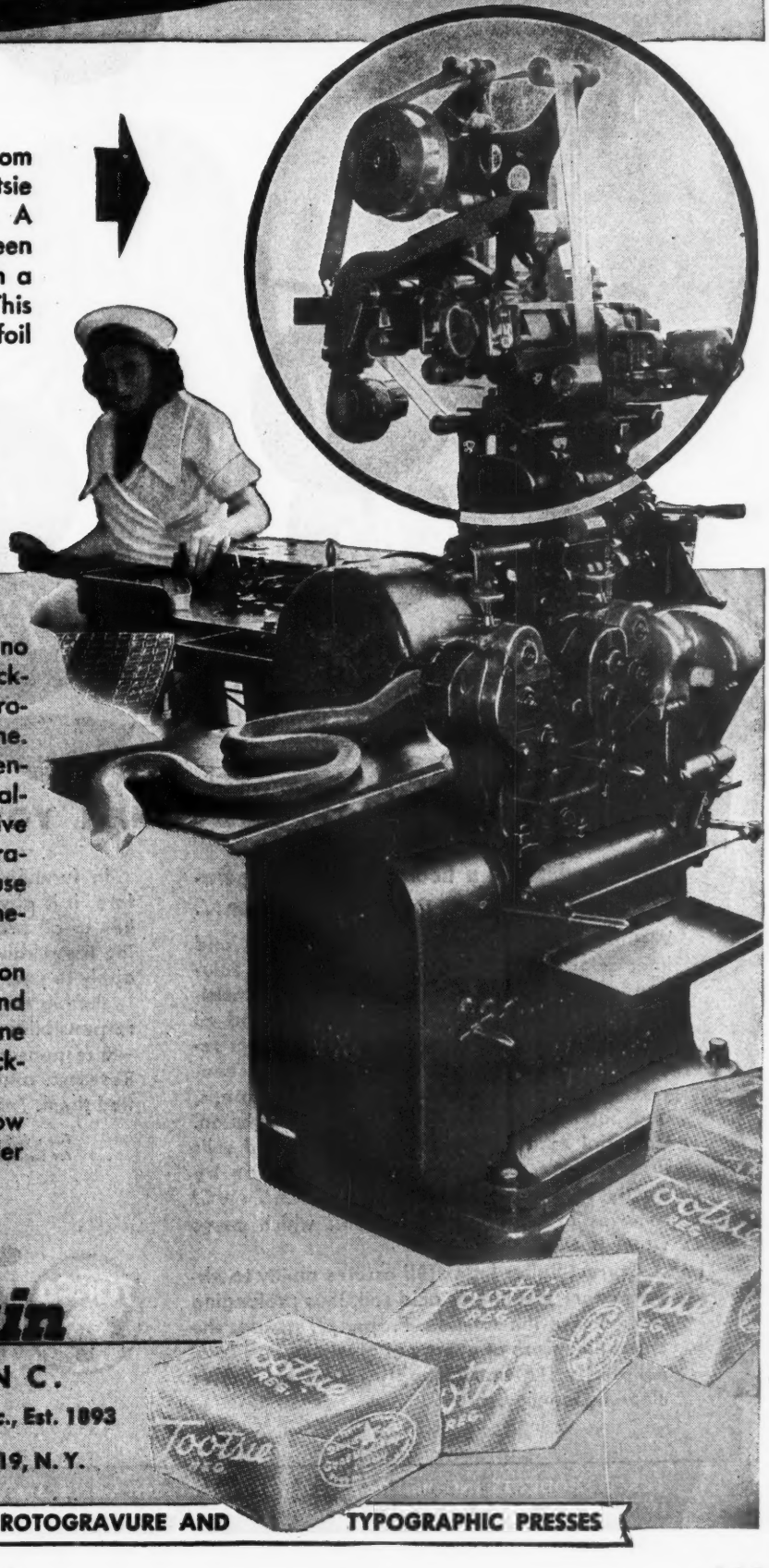
Now under aggressive ownership and leadership of men experienced in producing Process Equipment, The Hamilton Copper and Brass Works, famous for fine craftsmanship, gives you superior research, engineering, and fabrication. Your inquiries will receive expert analysis, plus prompt, efficient service. Standard Kettles, Fabricated in Copper, Stainless Steel, Monel and Nickel. Capacity: 15 gallons to 500 gallons. Tilting and non-tilting agitating, single and double motion.

Hamilton
COPPER AND BRASS WORKS
HAMILTON OHIO • U.S.A.

PLAN NOW FOR POST WAR TO PRINT AS YOU PACKAGE

It's one continuous operation from a roll of plain cellophane to "Tootsie Caramels" ready for packaging. A Champlain rotogravure press has been mounted on and synchronized with a Rose Caramel wrapping machine. This press prints equally well on paper, foil and glassine.





Printing is produced at almost no expense when you "Print As You Package" with a Champlain press synchronized with your packaging machine.

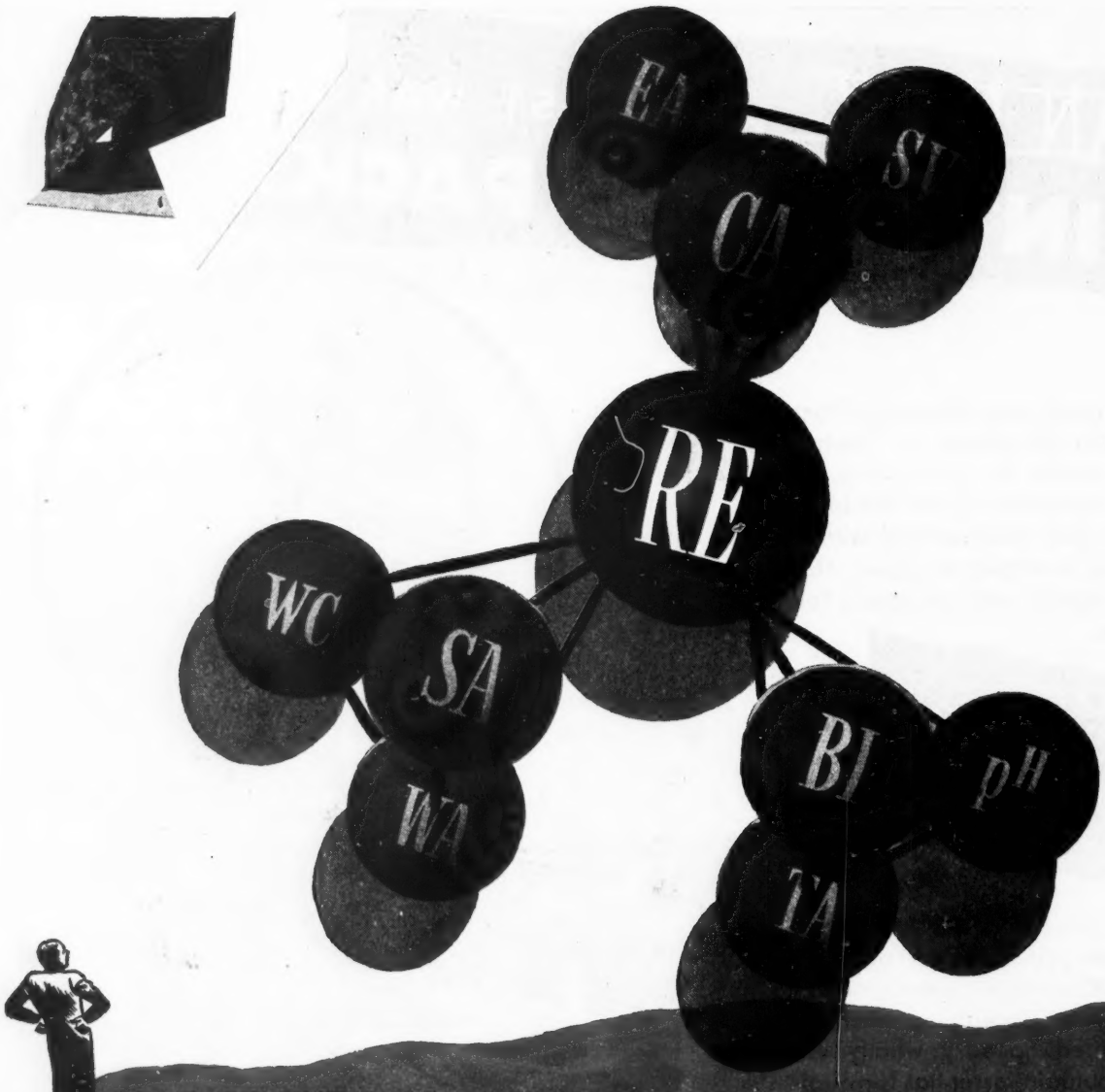
The Patented Speedry wholly enclosed ink fountain, essential for quality automatic printing, is an exclusive feature of these Champlain rotogravure presses. It makes possible the use of highly volatile inks which dry immediately.

Printing is automatic and operation is simple. The roll of stock is unwound from a stand and travels through one or more printing units into the packaging machine.

Priority orders are being taken now for post-war delivery. Write for folder entitled "Print As You Package."

Champlain
COMPANY, INC.
An Affiliate of The Fred Goat Co., Inc., Est. 1893
636 Eleventh Avenue, New York 19, N. Y.

MANUFACTURERS OF ROTOGRAVURE AND TYPOGRAPHIC PRESSES



THIS IS WHAT HAPPENS WHEN YOU WASH A FLOOR

Correctly cleaning a floor is no simple operation... these elements must go into action...

Wetting Action *(WA)* must lower surface and interfacial tensions and allow the cleaning solution to penetrate to surface of the base. Emulsifying Action *(EA)* must disperse grease and oil as tiny globules, and by suspension prevent redeposition. Saponifying Value *(SV)* must convert organic fats and oils into soluble soaps, and Solvent Action *(SA)* put soils into solution. Colloidal Activity *(CA)* must disperse solid soils into minute particles which may then be easily removed. Water Conditioning *(WC)* removes or controls the elements which cause water hardness.

Correct Buffer Index *(BI)* assures ability to absorb either alkaline or acid soil, thus prolonging efficiency of the solution. Proper *pH* assures the correct measure of energy of alkalinity and Total Alkalinity *(TA)* must supply maximum active cleaning energy.

In formulating a cleaning compound, therefore, it is obvious that no one factor is a magic key to all problems. The answer is in determining the relative value of *all* these factors as they apply to your problem.

Putting these factors into correct balance is a responsibility you can entrust to Turco chemists —a responsibility for which their two decades of Research and Experience *(RE)* have well qualified them. *Take your problem to Turco.*

For a fuller explanation of these vital factors, write for Turco's Booklet on your firm letterhead, please.

TURCO

TURCO

INDUSTRIAL CHEMICAL COMPOUNDS

TURCO PRODUCTS, INC. *Main Office and Factory:* 6135 S. Central Ave., Los Angeles 1, Calif. • *Southern Factory:* 1606 Henderson St., Houston 1, Texas • *Chicago Office and Factory:* 125 West 46th Street, Chicago 9 • *Offices and Warehouses in All Principal Cities*

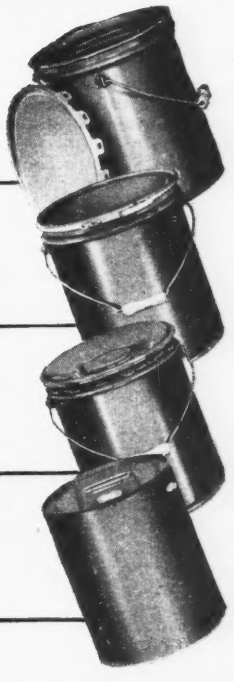
UNDISPUTABLE SUPERIORITY

FOR SAFE PACKAGING

INLAND STEEL CONTAINERS

The proven success and undisputed superiority of Inland Steel Containers for military use has made them the natural first choice of packaging engineers for packaging civilian products.

Steri Seald lined steel containers can be depended upon for trouble-free packaging of those foods, chemicals and petroleum products requiring *plus* protection and shipped under any conditions anywhere.



No. 584 LUG COVER PAIL

No. 514X LEVER LOCKING RING PAIL

No. 584R SWIVEL-SPOUT POR-PAIL

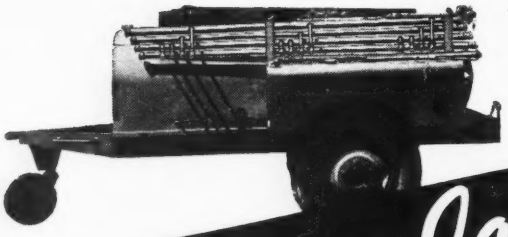
No. 594Q CLOSED TOP PAIL

INLAND STEEL CONTAINER CO.

Container Specialists

6532 S. MENARD AVENUE, CHICAGO 38, ILLINOIS

PLANTS AT: CHICAGO • JERSEY CITY • NEW ORLEANS



Doing a Job — IN THE FIELD TODAY — IN YOUR PLANT TOMORROW!

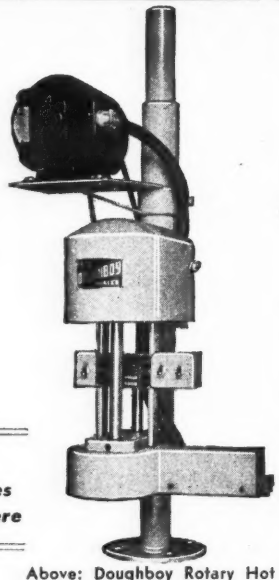
RIGHT NOW, O & S *Powermasters* are proving their speed and efficiency in O & S-designed Mobile Shower Units for the U. S. Army. Tomorrow, they will do the same in your plant. Investigate now. Get Powermaster Bulletin No. 1213 — write Orr & Sembower, Inc., 932 Morgantown Rd., Reading, Pa.

ORR & SEMBOWER INC. O&S
READING • PENNSYLVANIA
Builders of Better Boilers Since 1885

Most of the big firms (and the smaller ones too) are using

DOUGHBOY HEAT SEALERS

Seal all types of Heat Sealing Materials
Rotary Unlimited to any size of package
Thermostatic Control
Fast-High Production



The Favorites Everywhere

Above: Doughboy Rotary Hot Krimp Sealer. Standard Model 199.50 Preheater 235.00

Left: Doughboy Toggle Jaw
8" bars 98.50
10" bars 106.00
12" bars 113.50

CLIP AND MAIL TODAY

PACK-RITE MACHINES
828 N. Broadway — Milwaukee 2, Wis.
Please rush information on your
☐ Doughboy Rotary ☐ Doughboy Toggle Jaw
Firm .....
Attention of .....
Address .....
City ..... State .....

DO YOU NEED COILS

FOR ANY OF THESE APPLICATIONS ?

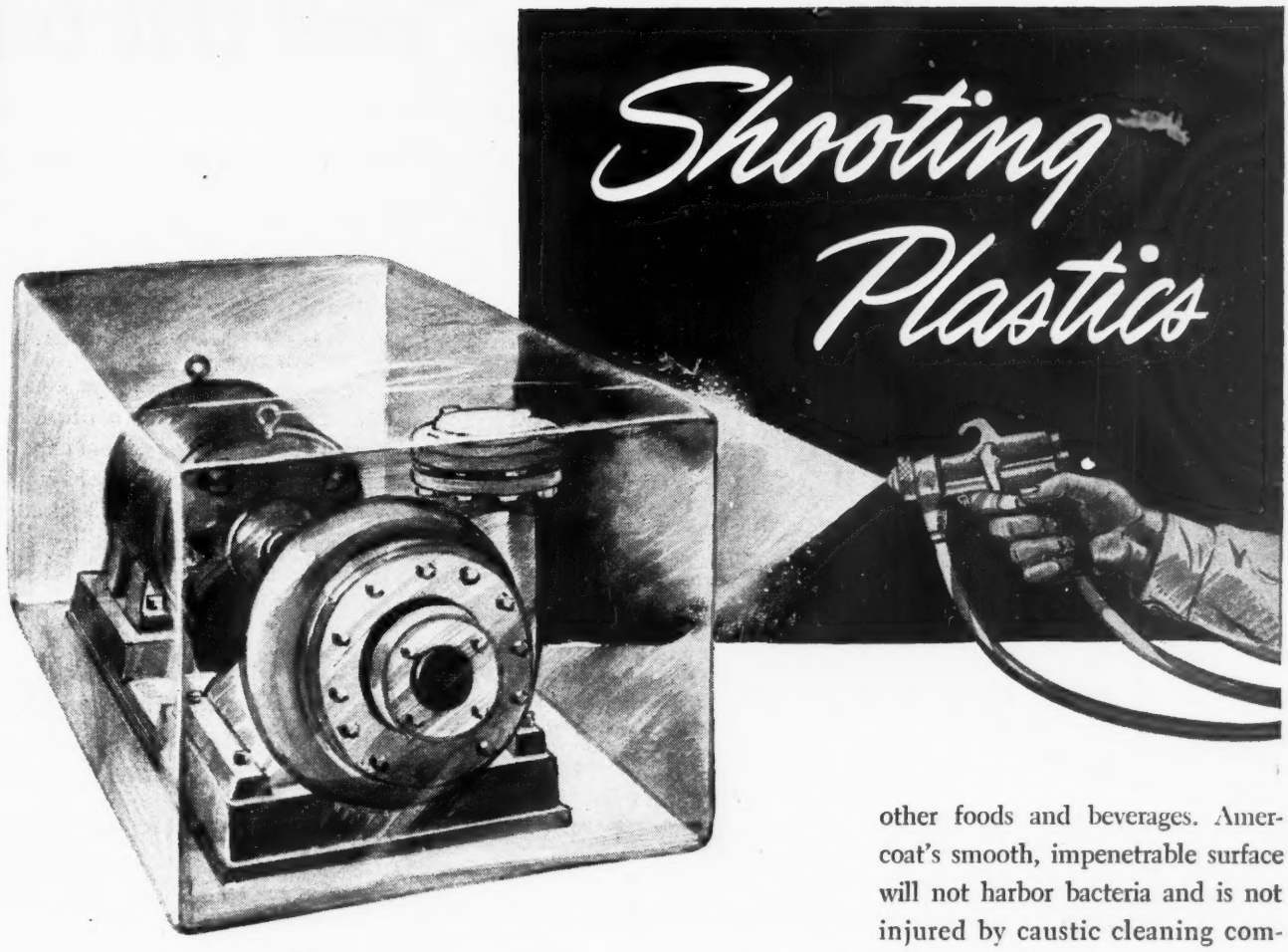
CHECK HERE
- DEHYDRATING
- HUMIDIFYING
- SPACE HEATING
- TEMPERING
- REFRIGERATING
- SPACE COOLING

• Eliminate special design and tool costs by selecting your coils from the wide range of standard sizes and models made by Young. Or take advantage of Young engineering service to obtain coils to meet your specific requirements as to size and materials (within the limits of government regulations). • Young coils embody many exclusive construction features . . . . are made of quality materials . . . . are thoroughly tested and accurately rated. • In addition to coils, Young produces many other types of heat transfer equipment. If *your* problem is heat transfer, consult Young engineers.

YOUNG RADIATOR COMPANY
Dept. 414-M Racine, Wisconsin, U.S.A.
Application Engineers in Principal Cities

YOUNG BUY BONDS PRODUCE MORE SALVAGE SCRAP WIN THE WAR
HEAT TRANSFER ENGINEERS

Manufacturers of Oil Coolers • Gas, Gasoline, Diesel Engine Cooling Radiators • Intercoolers • Heat Exchangers • Engine Jacket Water Coolers • Unit Heaters • Convectors • Condensers • Evaporators • Air Conditioning Units • Heating Coils • Cooling Coils • and a Line of Aircraft Heat Transfer Equipment.



. . . to Save Money!

Quickly and easily, an ordinary spray gun shoots Amercoat Plastic Coating on food processing machinery, floors, walls, tanks and other equipment or structural surfaces.

Results? Two of them — and both highly important —

First, positive protection against corrosion. Those structures and equipment are encased in a tough, durable plastic skin impervious to moisture, salts, acids, alkalies.

Second, positive protection against food *contamination* by the products of corrosion. Amercoat thus minimizes spoilage of fruit and vegetable juices, butter, syrups, milk, sugar, meat, cheese, spirits, oils and many other foods and beverages. Amercoat's smooth, impenetrable surface will not harbor bacteria and is not injured by caustic cleaning compounds. Sanitation is made easier.

The *dual* protection provided by Amercoat Plastic Coatings reduces costly maintenance and replacement, conserves vital food products and supplies, saves time and money.

Amercoat is applied cold, by spray or brush, to metal, concrete, wood. It is odorless, tasteless, chemically inert; dries rapidly, no baking required.

Get the facts about Amercoat dual protection in terms of your corrosion-contamination problems.

Write for illustrated booklet

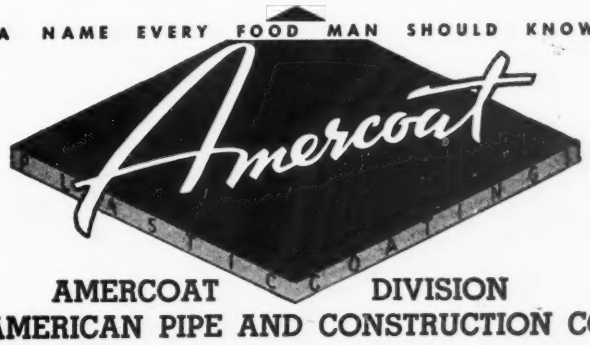
YOUR ASSURANCE OF 100% RESULTS

Your letter explaining your particular problem will receive the attention of our technical staff. Amercoat will be recommended for your use *only* after thorough analysis or past experience definitely proves its practical value. Descriptive booklet sent on request.

MANY INDUSTRIES USE AMERCOAT PROTECTION.

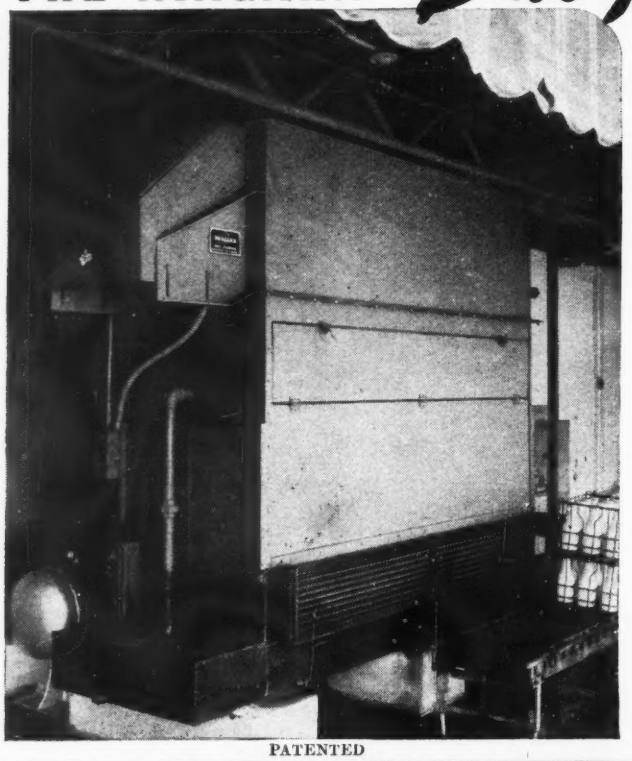
such as:			
MARINE	BOTTLING	CHEMICAL	SHIPBUILDING
FOOD	HOSPITAL	DISTILLING	PHOTOGRAPHIC
SOAP	FISHING	CONCRETE	PETROLEUM
WINE	MINING	CANNING	CONSTRUCTION
DAIRY	LAUNDRY	AVIATION	TRANSPORTATION
	BREWING	BEVERAGE	SEWAGE DISPOSAL

"A NAME EVERY FOOD MAN SHOULD KNOW"



AMERCOAT DIVISION
AMERICAN PIPE AND CONSTRUCTION CO.
P.O. Box 3428, Terminal Annex, Los Angeles 54, California

THE NIAGARA "Duo Pass" GIVES LONG LIFE



PATENTED

TO THE SAVINGS, AND INCREASED PRODUCTION CAPACITY, OF EVAPORATIVE REFRIGERANT CONDENSING

● Only in the NIAGARA Aero CONDENSER will you find the "Duo-Pass" pre-cooling method that prevents scale formation on the outside of the condensing coil, eliminating shut-down periods for cleaning, and assuring full condensing capacity at all times.

Thus, with condensing coils that are always clean, the extra heat transfer of evaporation with outdoor air as the condensing medium provides excess capacity, reducing head pressures and giving large savings in power, constantly, to the user. 95% of the water bill is also saved. These savings quickly repay the cost of installation. Write for descriptive bulletin No. 91.

NIAGARA BLOWER COMPANY

Over 30 Years of Service in Industrial Air Engineering

Dept. FI-124, 6 E. 45th St. NEW YORK 17, N. Y.

Field Engineering Offices in Principal Cities

INDUSTRIAL COOLING HEATING • DRYING **NIAGARA** HUMIDIFYING • AIR ENGINEERING EQUPT.

Packaging With Real Sales Appeal

Labels • Box Wraps
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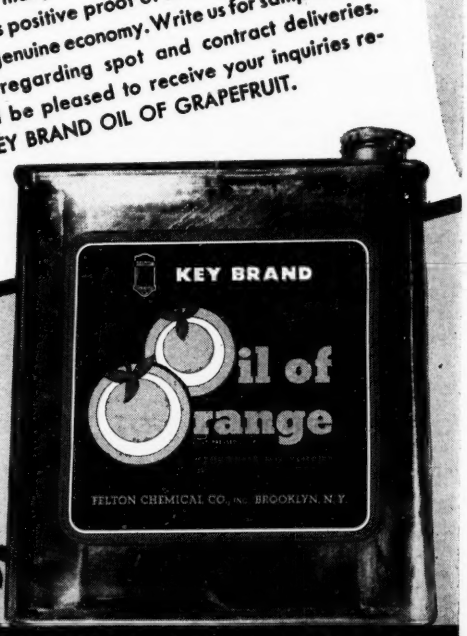
"THERE IS NO FINER"

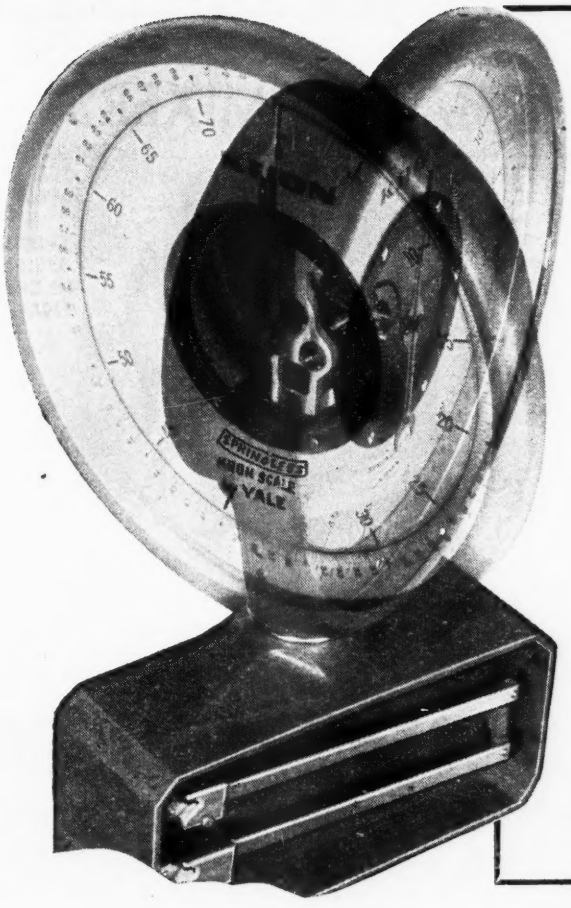
The impressive demand for KEY BRAND OIL OF ORANGE, by many of the country's leading users of Orange Oil, is positive proof of its finer flavor, uniform quality and genuine economy. Write us for samples and information regarding spot and contract deliveries. We shall be pleased to receive your inquiries regarding KEY BRAND OIL OF GRAPEFRUIT.



FELTON Quality

BRANCHES IN PRINCIPAL CITIES

FELTON CHEMICAL Co. Inc.
599 JOHNSON AVENUE, BROOKLYN, N. Y.
Manufacturers of Flavors, Essential Oils, Aromatic Chemicals and Perfumes



MEET YOUR *hidden losses* FACE TO FACE

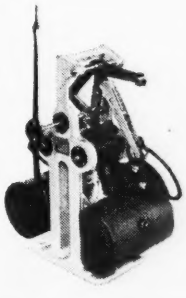
IN

WEIGHING...COUNTING
BATCHING...MEASURING
TESTING...INSPECTING

"Hidden losses" creep into your production costs every time a scale operator is forced to "guesstimate" a weight reading. When high, bulky loads obscure the scale dial face, time is lost, materials wasted and mistakes made. When faulty lighting prevents hair-line weight readings, "hidden losses" cut into profits.

To help you meet these "hidden losses" face to face, every Kron precision dial scale is equipped with the exclusive Kron Swivel Dial. The entire dial head rotates smoothly and freely through a complete circle in either direction at absolutely no loss of scale accuracy. At the operator's convenience, the Swivel Head can be turned to any desired position for a clear, unobstructed, accurate view of the dial chart and pointer.

Only Kron brings you this modern weight reading feature. Discover how its advantages will cut costs for you. Write to The Yale & Towne Manufacturing Company, Philadelphia Division, Philadelphia 24, Pa. and ask for your copy of the new catalog of Kron Scales made by Yale.

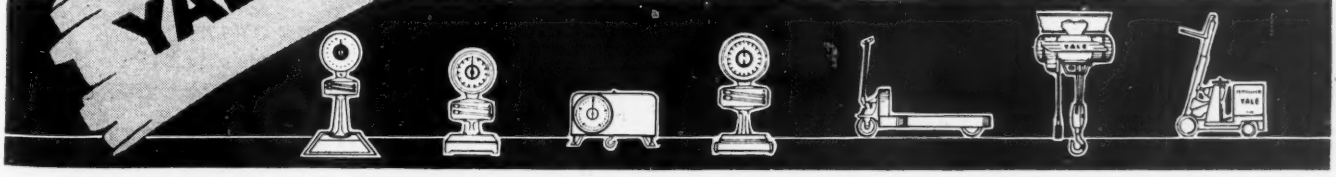


...FOR DEPENDABLE ACCURACY

An exclusive Kron engineering development, the improved ball bearing dial mechanism of the double pendulum, springless type, is the heart on which every Kron Scale depends for its unmatched accuracy and long life. Interchangeable in every Kron scale model, it reduces production weighing to a simple "load and look" procedure, cutting costs and saving time.

KRON INDUSTRIAL SCALES

FOR WEIGHING, COUNTING, BATCHING, MEASURING, TESTING



MATERIALS HANDLING MACHINERY: TRUCKS—HAND-LIFT AND ELECTRIC • HOISTS—HAND AND ELECTRIC

FOR A MERRIER CHRISTMAS IN 1945 BUY U. S. WAR BONDS AND STAMPS TO-DAY

Florasynth

LABORATORIES, INC.

CHICAGO 6 • NEW YORK 61 • LOS ANGELES 27

DALLAS 1 • DETROIT 2 • MEMPHIS 1 • MINNEAPOLIS 2
NEW ORLEANS 13 • ST. LOUIS 2 • SAN FRANCISCO 3 • SEATTLE 4
Florasynth Labs. (Canada) Ltd.—Montreal • Toronto • Vancouver • Winnipeg
Florasynth Laboratories de Mexico S. A.—Mexico City

GRUENDLER CRAFTSMANSHIP
Serving Industry over 50 Years

BATCH MIXERS

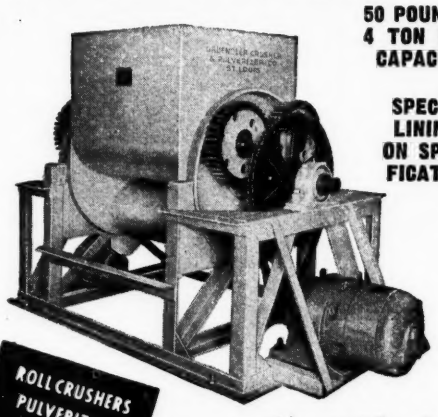
BUILT FOR ALL TYPES OF MATERIALS, DRY, MOIST, LIQUID

★

WRITE FOR DATA

50 POUNDS TO 4 TON BATCH CAPACITIES

SPECIAL LININGS ON SPECIFICATION



. . . with specially designed double spiral agitators for thorough complete mixing. Effective power transmission arrangements and massive bearing construction and base supports for continuous operation.

GRUENDLER

CRUSHER *and* PULVERIZER CO.

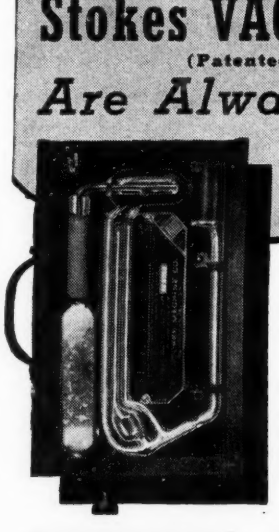
2915-17 North Market St., ST. LOUIS (6), MO.

Stokes VACUUM GAUGES

(Patented McLeod Type)

Are Always Accurate

Require No Calibration



• RAPID READINGS in 2 to 5 seconds.

• ACCURACY is permanent—unaffected by the presence of all gases, including hydrogen, and condensable vapors including water.

• PORTABLE OR PERMANENT MOUNTING. Rugged, compact, light in weight. Simple to operate—just tip and read.

• THOUSANDS IN USE.

THREE MODELS

A. 0 to 5000 microns
B. 0 to 700 microns (with readings to 1/10 micron)
C. 0 to 70 microns (with readings to 1/100 micron)

F. J. STOKES MACHINE CO.
5976 Tabor Road Philadelphia 20, Pa.

Stokes *High Vacuum*
PUMPS • GAUGES • EQUIPMENT

Let Duraglas Containers Help Label Your Products

● Duraglas food containers are the simplest, easiest and best method of modern visible labeling.

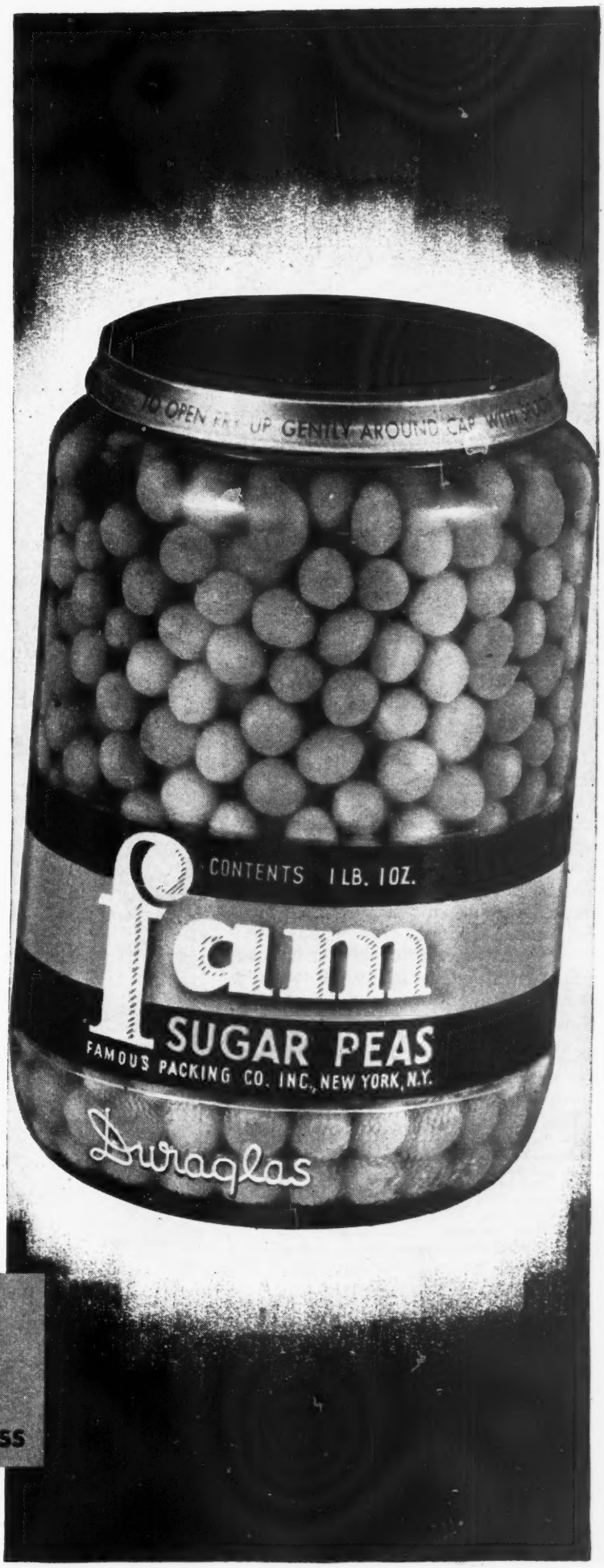
For clear, sparkling Duraglas containers let your products sell themselves because size, quantity, quality, color and condition are apparent at a glance.

By adding this eye-buy appeal to your brand acceptance you create a powerful merchandising force that will prove most profitable in the hard selling days ahead.

Duraglas vegetable jars are lighter (49.2% lighter than in 1936), stronger, easier to pack, to open and to use. They tell buyers that you cannot use a better container for your products.

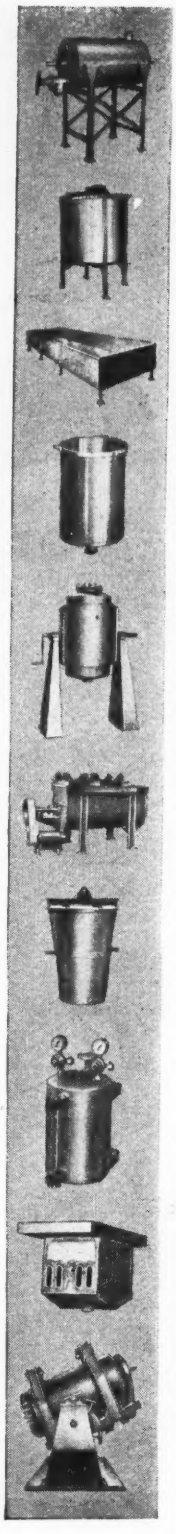
Present experience with packing in Duraglas containers is helping many companies get ready for the hard competitive selling ahead—the days when your products in individual showcases of Duraglas containers will have and hold an edge on competition.

Enjoy Fred Waring and his Pennsylvanians: Full half hour program once a week over the entire Blue Network. Consult your newspaper for local time and station.



Duraglas
TRADE MARK REG. U. S. PAT. OFF.
CONTAINERS
YOU CAN SELL IT BETTER IN GLASS

OWENS-ILLINOIS GLASS COMPANY
TOLEDO 1, OHIO



CAN YOUR PRESENT EQUIPMENT MEET POST-WAR RECONVERSION?

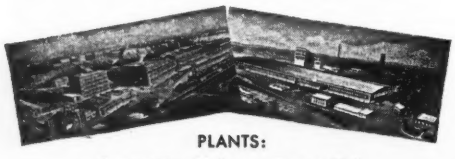
Alert food manufacturers, even though busily engaged in wartime production, are already making plans to reconvert their equipment to post-war needs. These men are preparing now to replace and modernize their worn and obsolete equipment in order that they may handle their growing post-war market without the loss of time or efficiency.

Koven can help you through this reconversion period. For more than 50 years, Koven has specialized in designing and manufacturing individualized food equipment. A staff of experienced engineers are at your disposal to work with you in designing equipment for your exact needs. This especially built equipment assures greater efficiency at a lower operating cost. Why not consult a Koven expert today? A consultation does not obligate you in any way. Simply call or write Koven.

Among the many KOVEN products in all the leading commercial and non-corrosive metals:

Stainless Steel
Aluminum Sheet Fabrication
Boxes, Tote, Waste Cans
Chemical Apparatus
Coils and Pipe Bands
Copper Sheet Fabrication
Galvanizing Work
Mixers, All Kinds
Monel Metal Fabricator
Pails, Special Heavy
Pans, All Types, All Metals
Sinks, Scullery and Factory
Tables, Galvanized or Monel
Tanks, All Types, All Metals
Kettles, All Types, All Metals

WATERFILM Industrial Heating Boilers



PLANTS:
Jersey City, N.J. Dover, N.J.

L. O. KOVEN & BRO. INC.
154 OGDEN AVENUE, JERSEY CITY 7, N. J.

Now Also Available in NEW LIGHT DUTY STYLE

All-Neoprene Latex INDUSTRIAL GLOVES

Impermeable to practically All Acids and Caustics

Highly Resistant to Oils and Greases

REQUEST SAMPLES AND PRICES

5 POPULAR STYLES

★ **No. 5760-5,** 18" LONG
EXTRA LONG GAUNTLET
GAUGE .030 TO .040
SIZES 10, 11

★ **No. 5737-2,** 14" LONG
LONG GAUNTLET
GAUGE .030 TO .040
SIZES 9-10-11-11½-12

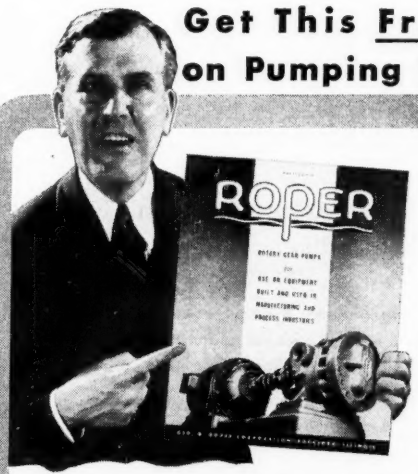
★ **No. 5705-5,** 11" LONG
SHORT GAUNTLET
GAUGE .020 TO .025
SIZES 9-10-11

★ **No. 5703-5,** 10½" LONG
STANDARD DUTY
GAUGE .015
SIZES 7-8-9-10-11

★ **No. 5702-5,** 10½" LONG
LIGHT DUTY
GAUGE .010 TO .012
SIZES 7-8-9-10-11

SEIBERLING LATEX PRODUCTS CO.
AKRON, OHIO
354 - 4th Ave., New York City Merchandise Mart, Chicago

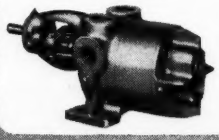
Get This Free Book on Pumping Problems



Ask For Bulletin No. 1255

It gives you valuable pumping information such as performance data, dimensions, weights, and pertinent engineering information.

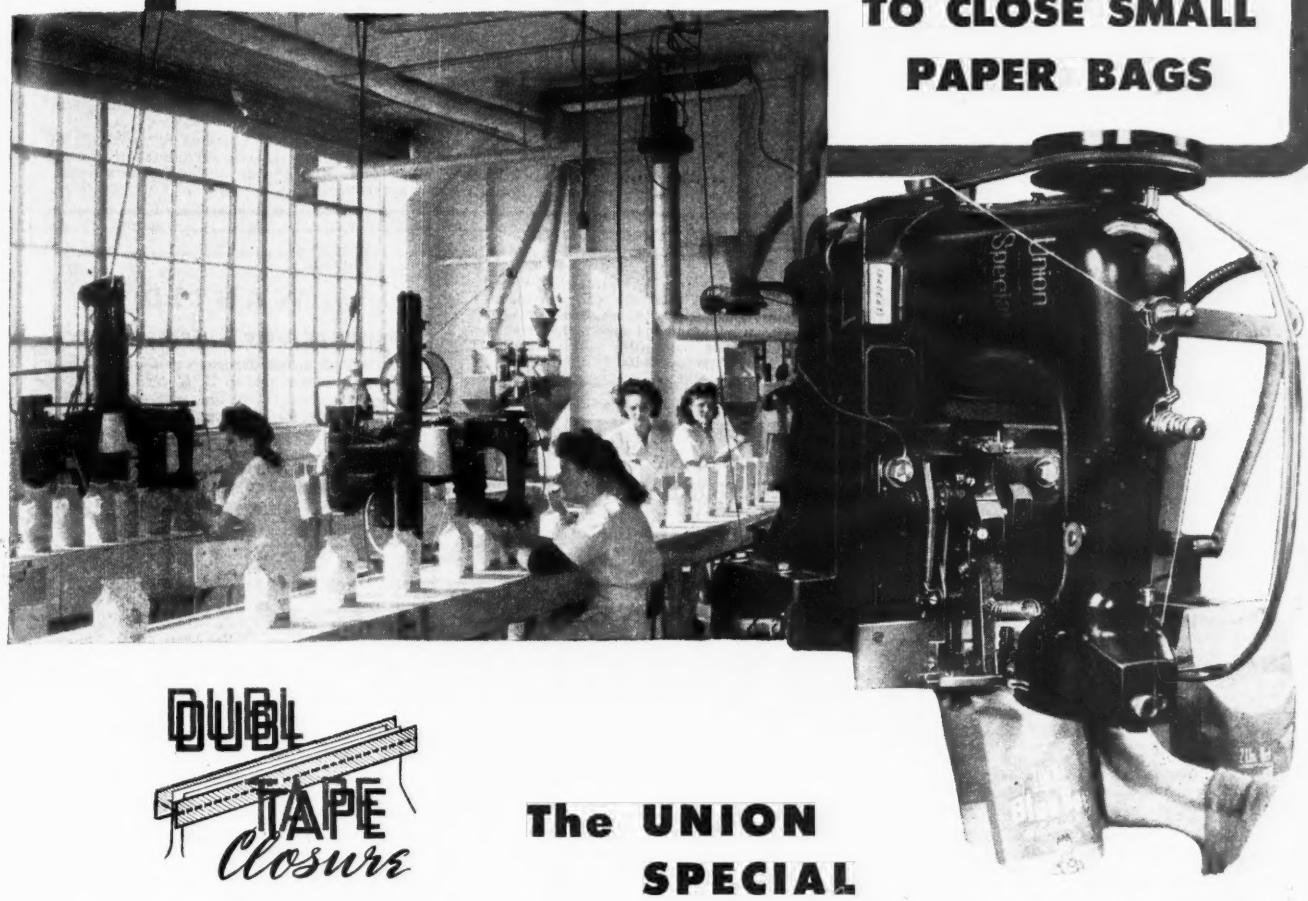
It fully describes and illustrates various installations. It describes the simplified Roper design and illustrates numerous models, individual parts, and cut-away views of complete pumps.



GEO. D. ROPER CORP.
ROCKFORD, ILLINOIS

ROPER *Rotary Pumps*

THE *Fast, Economical* WAY TO CLOSE SMALL PAPER BAGS



DUBL TAPE *Closure*

FAST—Keyed to the output of standard filling of weighing equipment.

ECONOMICAL — Uses inexpensive cotton thread and paper tape.

EASY TO OPERATE—Inexperienced help can be trained to operate the machine in a few hours. Light, easy work.

DEPENDABLE — A precision built, quality machine designed for years of service.

SEMI-AUTOMATIC OR AUTOMATIC — For use as one operator machine or as part of completely automatic installation.

The UNION SPECIAL 60000 C Sewing Machine

THIS MACHINE produces the Dubl-Tape sewed closure which makes the small bag the ideal package for a wide variety of dry products. It is winning popularity with packagers all over the country because of its low cost of operation and the high merchandising value it adds to the bags.

The Dubl-Tape Closure has a neat and attractive appearance. Firm, sturdy stitching protects the contents, yet the consumer finds the bag easy to open. It is packaging which is approved by the retailer and the consumer alike.

NEW BULLETIN NO. 200 gives complete information concerning the closure, its applications, the machine which produces it and how this machine may best be installed for your use. Write today for facts about this latest packaging method and the most effective way to cut packaging costs.

Union Special *Machine Company*

450 North Franklin Street,
Chicago 10, Illinois

Originators of Filled Bag Closing Machines.

POSITIONS VACANT

RESEARCH CHEMIST thoroughly familiar with carbohydrates and proteins particularly puffed breakfast foods, must also possess extensive research experience. P. O. Box 712, Milwaukee, Wis.

EXCELLENT OPPORTUNITY for man forty-five or under preferably with some cold storage experience to accept position as assistant to manager of cold storage warehouse. If qualified can be assured of manager's position within three years. All communications will be treated confidentially. Write stating age, experience and salary expected. P-460, Food Industries, 330 W. 42nd St., New York 18, N. Y.

WANTED—FACTORY production executive by prominent well established full line Northeastern vegetable canner. Your investigation will immediately indicate this position offers unusual present and future opportunities. But we expect unusual qualifications and highest ability. Write freely since replies will be held strictly confidential and indicate all past positions held, salary received and enough to enable us to determine whether interview our office at our expense would be worthwhile. P-476, Food Industries, 330 W. 42nd St., New York 18, N. Y.

AGRICULTURAL CHEMIST for research work in development of new methods for the sterilization and preservation of fresh fruits and vegetables. Plant pathology training preferred. Give full particulars, experience, education, age and salary expected. Permanent. Plant, Riverside, California. P-477, Food Industries, 68 Post St., San Francisco 4, Cal.

CANNING TECHNOLOGIST; B.S. degree. Several years' experience desired for research and development. Headquarters in Eastern Pennsylvania. Give details, training, experience, draft status, etc. P-478, Food Industries, 330 W. 42nd St., New York 18, N. Y.

FOOD CHEMIST—Good opportunity with a Philadelphia company for chemist with practical production experience to develop products for bakery, ice cream and confectionery trade. P-479, Food Industries, 330 W. 42nd St., New York 18, N. Y.

WANTED—YOUNG Woman chemist for control work on flavoring extracts. Excellent opportunity with large New England bakers supply house. Write experience in detail. P-480, Food Industries, 330 W. 42nd St., New York 18, N. Y.

WANTED—FACTORY cost clerk for large sausage manufacturing plant. Also junior accountant. If you are between the ages of 25 and 35 and can qualify for either of these positions, kindly write giving full particulars. Peters Sausage Co., 5454 W. Vernor Highway, Detroit 9, Michigan.

POSITIONS WANTED

EXPERIENCED IN bacteriology, industrial microbiology, and food technology. Just completed research for Armed Forces and will consider position of Research Director or Production Manager. Twenty years' experience in solving problems in canning fruits and vegetables, shell and frozen eggs, seafoods, pickles, meats and other products. 15 years in executive positions handling budgets, reports, and personnel. PW-439, Food Industries, 330 W. 42nd St., New York 18, N. Y.

FACTORY MANAGER—38 years old, married. Graduate Mechanical Engineer. Capable of directing organization of several hundred people. Excellent background. I get along well with men and women. PW-440, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

CHEMIST—Flavors, fruit juices, wines, baking specialties, essential oils, dairy products. Production, development and control. Eastern United States. PW-482, Food Industries, 330 W. 42nd St., New York 18, N. Y.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: "OPPORTUNITIES" :EQUIPMENT
BUSINESS: :USED OR RESALE

UNDISPLAYED —RATES— DISPLAYED

(Not available for equipment advertising)
10 CENTS A WORD. MINIMUM CHARGE $2.00.
Positions Wanted (full or part time individual salaried employment only), ½ the above rates payable in advance.
Box Numbers—Care of publication New York, Chicago or San Francisco offices count as 10 words.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Individual Spaces with border rules for prominent display of advertisements.
The advertising rate is $6.00 for inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
An advertising inch is measured ⅞" vertically on one column. 3 columns—30 inches—to a page.

NEW ADVERTISEMENTS received by December 22nd will appear in the January issue, subject to limitations of space available. F. I.

25 year old concern with considerable capital and expanding present operations wants to contact man who has connections with suppliers and users of foodstuffs. Good future and opportunity to share in profit for capable man. Give full information. All replies treated confidentially.

RW-473, Food Industries
330 West 42nd St. New York 18, N. Y.

POSITIONS WANTED

EXPERIENCED PICKLE man — at present plant and production manager of a pickle plant. Thoroughly familiar with all phases of production, understand labor problems, and modern plant layouts. Can build a continuous pasteurizer with a capacity of 50 qts. per minute. Worked past season on Spring and Fall crops from southern and northern states. I am in the East and planning a trip West. PW-481, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

FOOD PRODUCTION Manager. Have had 25 years experience in managing the mars production of quality foods including preserves, fountains ice cream products, baking specialties and bakery supplies. Know equipment production. Control technique and how to handle men. Can furnish the best of references. PW-483, Food Industries, 330 W. 42nd St., New York 18, N. Y.

DAIRY TECHNOLOGIST desires position utilizing practical engineering background in dairy and beverage processing equipment. Have had 5 years experience in nationwide machinery sales engineering and 3 years experience in food production managing group of spray drying plants. Desire permanent position with an interesting future, married, draft deferred. PW-484, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

ASSISTANT PLANT engineer. Draftsman layout and detail. Food-confec. plant, seeks position in or near New York. PW-485, Food Industries, 330 W. 42nd St., New York 18, N. Y.

EXPERIENCED CHEMIST, initiative, creative ability, desires responsible position, New York metropolitan area. Thoroughly familiar with production: flavors, extracts; im. spices; syrups; beverages; cocoa, chocolate products; cereals, nut crunch; other toppings; fully prepared cake and other flour mixes; pudding, gelatin dessert, pie filling and ice cream, powders, jellies; preserves; sauces; condiments; canned fruits; vegetables, meats and other food specialties. PW-486, Food Industries, 330 W. 42nd St., New York 18, N. Y.

PRODUCTION MANAGER, experienced in tin or glass, wishes to make hook-up with cannery. Write particulars. PW-487, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

(*Continued on page* 205)

WANTED

MANUFACTURER'S REPRESENTATIVE

Accredited manufacturer seeking salesmen, dealers, engineers, in U. S. and abroad for new, powerful, compact, non-electric magnetic separator (tramp metal eliminator) needed by food processors, feed and flour mills, elevators. Also distribution for magnetic filter, for oil and other liquids. Now making immediate deliveries of both in U. S., Canada, Mexico. No priority problem. Address

RW-450, Food Industries

330 West 42nd St. New York 18, N. Y.

REALIZE LARGE

TAX BENEFITS

Sell Your Business Now

FOR CASH

Assets, Capital Stock, Family Holdings of

INDUSTRIAL PLANTS, MF'G DIVISIONS or UNITS

WILL BE PURCHASED BY LONG ESTABLISHED, REPUTABLE FIRM WITH SUBSTANTIAL CAPITAL

We are principals, and act only in strictest confidence, retaining personnel wherever possible. Address Box 238A, 1474 Broadway, N. Y. C.

Thoroughly experienced

FOOD TECHNOLOGIST
(GRADUATE CHEMIST)
AVAILABLE

20 years experience with especially thorough background in technical processing problems in canned foods and in the can manufacturing field. Has a successful record in the development of new food products. Familiar with development work and processing problems in frozen and dehydrated foods. Mechanical ability. Forty years of age.

Prefer consultant position with large concern, or interested in securing interest in small plant where salary is commensurate with profits of company. West Coast location preferred.

PW-475, Food Industries
520 N. Michigan Ave. Chicago 11, Ill.

WANTED: BAKERY PRODUCTS OF MERIT

NATIONAL SALES ORGANIZATION, WELL KNOWN FROM COAST TO COAST—SPECIALIZING IN BAKERY INGREDIENTS —IS INTERESTED IN HANDLING SALES AND DISTRIBUTION TO WHOLESALE BAKERIES ONLY. WILL MERCHANDISE ON EXCLUSIVE BASIS OR UNDER OUR OWN LABEL. GIVE FULL PARTICULARS.

BO 449 Food Industries
330 West 42nd St. New York 18, N. Y.

FOR VICTORY NOW – AND PROSPERITY LATER BUY AND HOLD WAR BONDS

11—Copper, Glass Lined, Kettles and Vacuum Pans, up to 550 gal. capacity.
10—Pony Mixers, 8 to 80 gal. capacity.
6—Dry Powder Mixers, various sizes to 2000 lbs.
2—Horizontal Steam Jacketed Mixers, 1100 gal. each.
14—Double and Single arm Mixers, jacketed and unjacketed, up to 500 gal. cap.
1—C. C. & S. 7-head Jumbo Model "B" Crowner, m.d.
2—Buffalo 24" Vanilla Bean Choppers.
2—World, 1—Ermold semi-auto. Labeling Machines.
1—No. 12 Sweetland Filters, with 36 monel leaves, 250 mesh, grooved.
6—Filter Presses P & F; recessed; to 42" square.
1—350 gal. Aluminum jack. agit. Kettle or Still.
8—DeLaval and Sharples Super Centrifuges.
2—Mechanical 4 x 9' Lard Rolls, m.d.
2—Schutz-O'Neil Pulverizers.
3—K. K. & U. S. Rotary bottle Rinsers, m.d.
1—5 x 25' Louisville Steam Tube Dryer.
2—Copper Tanks to 1650 gal.
1—U. S. Brightwood Box Machines.
1—Pneumatic Scale straight line Bottle Cleaner.
1—Day Imperial No. 30 jack. Mixer, 75 gal.
2—Horiz. Jack. closed steel Mixers, 5' x 6'.
1—20 gal. Aluminum jack. Kettle.
1—Victoria No. 50 Peeler, DC motor.
1—World Rotary Automatic Labeler M.D.
2—Burt & Knapp automatic Labelers.
Roller and Belt Conveyors all sizes.
1—6" Premier Colloid Mill M.D.
3—Howes Barrel Packers.
1—90-gallon Stainless Steel, jack. Kettle.
2—Bufalovac 32" x 72" Atmospheric Double Drum Dryers.
1—Pneumatic Scale, full automatic Packaging Unit.
1—Pneumatic Scale, automatic, 6-head Capper and Cap Feeder, M.D.
10—Dopp cast iron, steam jacketed Kettles, up to 100 gallons capacity; some with agitators.
2—12" Mikro Pulverizers, M.D.
2—Rotex Sifters, 20" x 48".
1—Triangle automatic Filling and Weighing Machine.
2—200 gallon Pfaudler Glass Lined Jacketed KETTLES; 1—150 gal. jack. agitated.
1—Day Auger Powder Filler.
1—F. J. Stokes Auger Powder Filler.
1—Sprout-Waldron 20" ATTRITION MILL with 2—10 H.P. A.C. Motors

1—Buffalo 48" x 40" VACUUM DRUM DRYER, with bronze chromium plated drum, Vacuum pump, Barometric condenser, Vacuum receiver, etc. All motor driven, still set up in operating condition.

BUY WITH CONFIDENCE

THE KEY TO SAVING TIME AND MONEY

FOR OVER A QUARTER CENTURY A SYMBOL OF CONFIDENCE

CONSOLIDATED PRODUCTS COMPANY, INC.

SELL US YOUR IDLE MACHINES

OFFICE: 13-17 Park Row, New York 7, N. Y. SHOPS: 335 Doremus Ave., Newark, N. J.

Send for "CONSOLIDATED NEWS" listing Complete Stock

SALESMAN WANTED

(Continued from page 204)

UNUSUAL OPPORTUNITY. Wanted by established, progressive packaging machinery manufacturer, a sales engineer with technical training, familiar with food packaging, to promote the sale and distribution of modern packaging machines throughout the middle west. Future limited only by your ability. Write giving details. Chicago office location. SW-488, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

SALESMAN AVAILABLE

SALES MANAGER. Experienced, capable, successful, acquainted with all outlets for foods, meats, and food specialties. Now handling advertising, sales promotions, productions and national sales organization. Well worth $10,000. Please write full details. SA-489, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

REPRESENTATIVE AVAILABLE

MANUFACTURER'S REPRESENTATIVE and Broker with competent sales force calling on department stores, grocery, hardware and drug jobbers in Texas, Oklahoma and New Mexico, now ready to take on new products of merit. Efficient, well organized service. Address Southwest Sales & Distributing Co., 2010 W. T. Waggoner Bldg., Fort Worth 2, Texas.

FREE BULLETIN

FIRST FACTS: Vol 1—No. 9, 8½x11, 8 pages including a 2 page stock list of "FMC" used processing equipment available, illustrated data on new equipment handled and current news abstracts. Write First Machinery Corp., East 9th St. and East Drive, New York 9, N. Y.

This established organization can give your specialty food items thorough distribution in the metropolitan N.Y. area. Contacts covering 500 wagon distributors.

FASTER FOOD PRODUCTS
15 Jay St. N. Y. 13, N. Y. WAlker 5-5815

WEST COAST BUYS

Air Compressor—67 CFM., with 10 HP. motor.
2—Horiz. Retorts, 28"x32"x15'6" long.
50 gal. copper still. With condenser.
Sterling 1-S Slicer. Pulley drive.
A-B Cooker & Cooler #2-#2½ cans.
Anderson #2 Dicer, Pulley drive.
Sprague Sells Syruper & Drainer for #1-T.
5—Can Labelers; Burt & Knapp.
8—Duplex Steam Pumps, large and small.
2—Hoepner Powder Fillers, Auger and Weigh Bucket.
U.S. Piston Type Filler, for jam, etc.

WRITE—WIRE—PHONE

We buy your idle equipment.

For Dependability with Economy

MACHINERY AND EQUIPMENT CO.

705 BRANNAN ST. SAN FRANCISCO 3, CALIF.

FOR SALE

250 gal. Stainless Steel Tanks, jkt., agit.
100 gal. Pfaudler Tank, jkt., agit.
150 gal. Pfaudler Jkt. Tilting Tank.
330 gal. Pfaudler Tank, jkt., agit.
450 gal. Pfaudler Tank, jkt., agit.
750 gal. Pfaudler Tank, 60" x 60".
300 gal. Nickel Tank, jkt., agit.
20" Tolhurst Centrifugal, copper basket.
25 and 50 gal. Copper Jacketed Kettles.
1½ bbl. Dough Mixer, 3 H.P.
50 to 400 gal. Homogenizers or Viscolizers.
6 ft. and 7 ft. Copper Vacuum Pans.
1—Spiral Roller Conveyor, 14½" wide, 12 round, 3 story with stands and center post.
4½"x6" Davidson Bronze Plunger Pump, Reeves Drive and 1½ H.P. motor.
Viking Bronze Pump, Reeves Drive and 1½ H.P. motor. *Send Us Your Inquiries*

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street New York 17, N. Y.
MUrray Hill 2-4616

FOR SALE

2—lines Triangle Fillers, Gluers, Sealers.
1—26" Robinson Attrition Mill.
2—4x6' Atmospheric Drum Dryers.
6—Anderson #2 Vegetable Dicers.
4—Colloid Mills: 1, 5 and 40 hp.
4—Water Stills: 5, 25, 100, 175 GPH.
2—Lard Rolls: 4x9' single, 2x5' double.
2—Mikro Pulverizers: 8" and 12".
1—100 sq. ft. single effect Evaporator.
1—Shipping carton Sealer & Comp. Unit.
1—#6 style B Peerless rotary Exhauster.
1—500 GPH. CP Homogenizer.
2—1000 lb. Dry Powder Mixers.
1—World rotary Automatic Labeler.
1—American s.s. Juice Extractor.

Send us your inquiries, also your list of surplus equipment, which we purchase for cash.

LOEB EQUIPMENT SUPPLY CO.
908 N. Marshfield Ave. Chicago 22, Ill.

AMMONIA FREEZING PLANT

for Quick Freezing or Cold Storage
FOR RENT

Brick building, size—50' x 96', comprising two harding rooms on one floor. Temperatures to 25° below zero. Located in Brooklyn, N. Y.

FR-472, Food Industries
330 West 42nd St. New York 18, N. Y.

100 gal. copper steam jacketed vacuum pan.
Several copper steam kettles and mixers.
Several copper tanks.

THOMAS BURKHARD, Inc.
494-496 Flushing Ave. Brooklyn, N. Y.

WHERE TO STORE FROZEN FOODS

QUAKER CITY COLD STORAGE CO.
PHILADELPHIA, PA.
3 WAREHOUSES 3
Proper Temperature For Frozen Foods

WHERE TO BUY
Featuring additional Equipment Materials and Supplies for the Food Processing Industries

Automatic Control
POWERS TEMPERATURE and HUMIDITY CONTROL
For Industrial Processes, Heating and Air Conditioning Systems, Hot Water Heaters and Shower Baths. Write for Bulletins.
Offices in 47 Cities
2793 Greenview Ave., Chicago, Ill.
THE POWERS REGULATOR CO.

WANTED

WANTED
2—Tablet Machines; 3—Filters.
2—Dry Powder Mixers, with or without Sifters.
2—Rotex Screens; 1—Packaging Machine; 1—Glass Lined Kettle; Stainless Steel, Monel, Copper or Aluminum Jacketed Kettle and Vacuum Pan.
W-132, Food Industries
330 West 42nd St., New York 18, N. Y.

WANTED
USED BOTTLING, SCREW CAPPING and PACKAGING MACHINES
for liquids, pastes and powders
Also Cartoning and Wrapping Machines
W 490, Food Industries
330 West 42nd St. New York 18, N.Y.

WANTED
Cellophane Bag Making Machine, also Cellophane printing equipment for printing from roll stock. Address:
Dehydrated Foods Co.
448 Penn Ave. So.
Minneapolis, Minn.

WANTED
USED TABLET MACHINERY
Or complete tablet plant
W 491 Food Industries
330 West 42nd St. New York 18, N. Y.

Don't forget the
BOX NUMBER
When answering the classified advertisements in this magazine don't forget to put the box number on your envelope. It is our only means of identifying the advertisement you are answering.

PROFESSIONAL SERVICES

PROCESSING PROBLEMS — PRODUCT DEVELOPMENT — MARKET RESEARCH
PLANT LAYOUT and DESIGN — PACKAGE DESIGN and TESTING
MANAGEMENT — PUBLIC RELATIONS — GENERAL CONSULTING — PATENTS
CHEMICAL, BACTERIOLOGICAL and NUTRITIONAL ANALYSIS

PETER D. BARAKAUSKAS
Consulting Food and Agricultural Chemist
Am prepared to render practical and technical services in all Fields of Agriculture: Foods, Commercial Feeds, Fertilizers, Soils and Insecticides.
1605 Westminister Ann Arbor, Michigan

SCHWARZ LABORATORIES, INC.
Analysts . . Biologists . . Consultants
Foods, Beverages, Oils, Water and Vitamin Determinations
202 East 44 Street New York 17, N. Y.

LABORATORY CONTROL
FOOD CONTROL LABORATORIES
513 Warren Street, Boston 21, Mass.

J. E. SIEBEL SONS' CO., Inc.
Biochemists - Analysts - Consultants
FOODS AND BEVERAGES
Research Problems . . Vitamin Assays
Operating
SIEBEL INSTITUTE OF TECHNOLOGY
950-970 Montana St. Chicago 14, Ill.

JOE LOWY
Consultant for Vinegar Manufacture.
Have erected or reconstructed more than 100 plants with Giant Recirculating (or Frings type) Vinegar Generators. Production results twice to five times of average. All items of fermentation including air strictly under control.
684 Riverside Drive New York 31, N. Y.

FOSTER D. SNELL, INC.
Our chemical, bacteriological, engineering and medical staff with completely equipped laboratories are prepared to render you Every Form of Chemical Service
Ask for copy of Bulletin 3W
302 Washington St. Brooklyn, N. Y.

FOR SALE

(Additional For Sale Ads on pages 205 and 207)

FOR SALE
Miller Cellophane Box Wrapper & Sheeter
Model C Cherry-Burrell Bottle Washer with motor driven pump
1 HP Lipman Self-contained Ammonia Refrigerating Unit with A.C. motor
80-qt. Read and Triumph Mixers
Type MG 4" Economy Centrifugal Pump
5" Gould Impellor Pump
16" and 20" Buffalo Food Choppers
Buffalo Food Grinder with 8⅝" plates
600 gal. Copper Kettle with coils for heating
16" Kent Burr Stone Mill belt drive
16" Schutz-O'Neill Style D Limited Pulverizer with dust collector
SAVAGE BROS. CO.
2638-46 Gladys Avenue Chicago

FOR SALE
1 No. 15 Unique Gyro-Sifter, made by the Robinson Mfg. Co. First-class condition. $300 f.o.b. our plant. For additional information, phone or write G. R. Miller.
Tasty Baking Company
2801 Hunting Park Ave. Philadelphia 29, Pa.

FOR SALE
1—KANE 20 H. P., 5—KANE 10 H. P. GAS FIRED BOILERS. 100 LBS. WORKING PRESSURE. COMPLETE WITH PUMPS, MOTORS, RETURN CONDENSATE TANK, AUTOMATIC CONTROLS, AUTOMATIC GAS SHUT-OFF AND REGULATORS. ALL RECENTLY RETUBED. GOOD CONDITION. WRITE
FS-474, Food Industries
330 West 42nd St. New York 18, N. Y.

SYNTRON HYDRAULIC JOLTERS—2 For Sale
For packing powdered materials into barrels. Excellent Condition.
FS447 Food Industries
330 West 42nd St. New York 18, N. Y.

WIRE CLOTH STAINLESS STEEL
117—Pcs. 48" x 48", 10 mesh
76—Pcs. 48" x 48", 20 mesh
36—Pcs. 48" x 48", ¼" sq. opening
This is all new material available for immediate delivery from Milwaukee stock.
NORDBERG MFG. CO.
Milwaukee 7, Wisc.

Your Inquiries to Advertisers Will Have Special Value . . .
—for you—the advertiser—and the publisher, if you mention this publication. Advertisers value highly this evidence of the publication you read. Satisfied advertisers enable the publisher to secure more advertisers and—more advertisers mean more information on more products or better service—more value—to YOU.

FOR SALE

1—Pneumatic Scale Straightline Duplex Labeler.
1—Consolidated Automatic, Single Head Powder Filler.
2—Howe-Weigh-O Graph Platform Scales.
9—New Portable Agitators, ¼ to 2 HP.
25—All Bronze Pumps, Centrifugal, Turbine and Gear.
1—200 Gallon Copper Jacketed Kettle.
2—525 Gallon Copper Hotwells.
1—Resina Automatic Screw Capper.
1—Set of 70 New Wood Plates and 69 Frames for 18" Shriver Filter.
30—Wood Tanks, 1,000-14,000 gallon capacities.
2—Grain Handling System with Hoppers.

NEW STAINLESS STEEL TANKS AVAILABLE.

Write For Latest Stock List

PERRY
EQUIPMENT & SUPPLY CO.,
1515 W. THOMPSON ST., PHILA. 21, PA.

SPECIALS

"Buflovak" Vac. Drum Dryer 24" x 20".
"Buflovak" Vac. Drum Dryer 48" x 40".
Two Truck Dryer 7' W. x 6' Deep x 7' High.
American Bond Scale Fillers Model G3.
Tolhurst Ext. 40" Copper Basket.
Bird Stainless Steel Centrifuges 48".
Sperry 42" Wd. P. & F. Filter Press, Closed Del'y.
2 Aluminum Jack. Kettles 80 Gals.
2 Nickel Jack. Kettles 330 Gals. with Ag.
Copper Jack. Kettle with Ag. 125 Gals.
Colton 3B Single Punch Tablet Machine, M.D.
Pfaudler Glass Lined Tank 600 Gals.
Stainless Steel Tank, 225 Gal. with Ag.
Double Deck Sifter M.D. 18" x 48".
Ft. Wayne Jr. Sterilizer 48" diam. x 46".

Send for our Latest Lists.

MACHINERY & EQUIPMENT CORPORATION (of N. Y.)
533 West Broadway
New York 12, N. Y.

SPECIALS!

1—No. 5 Sweetland Filter, stainless steel
1—W & P 150 gal. Mixer, stainless steel
2—Hersey Rotary Dryers, 4'9 x 27'
1—Copper Shell Rotary Dryers, 6' x 17'
3—Union Special Bag Sewing Machines
1—Stokes RDS3 Rotary tablet machine, 1¼"
2—Hepworth 48" Centrifugals, M.D.
1—Buflovak Drum Dryer, 24" x 20"
2—50 gal. Copper Vacuum Pans
1—Fort Wayne, Jr. Sterilizer
3—Sharples No. 6 Centrifuges
5—24" to 42" Filter Presses
1—Premier 5" Colloid Mill
3—Tyler and Rotex Screens
1—Knapp #210 Can Casing Unit
3—Powder Mixers, 800 to 2000 lb.

New Stainless Steel Tanks Available
WANTED: Robinson 30" Attrition Mill M.D.

Send for our latest list

BRILL Equipment Co.
225 WEST 34th STREET, NEW YORK 1, N.Y.

UNION Rebuilt Machinery Established 1912

REBUILT GUARANTEED MACHINERY

SPECIAL
Just Received

Elgin 24 spout Rotary Vacuum Filling Machine
Filler 4 Plunger Filling Machine for Jellies, etc.
Karl Keifer Visco Type Rotary Filling Machine
Burt Can Labelling Machine

In Stock . . . Ready For Immediate Delivery

All Offering Subject to Prior Sale!

Wire Collect for Prices and Details!

Micro 24" Pulverizing Machine directly connected with Motor.

Ermold Bottle Labeling Machines, motor driven.

U. S. Bottlers 10 spout Model C-10 **Filling Machine,** 4 to 16 oz. cap.

World, Fully Automatic, Rotary Bottle and jar labeler.

World, Semi Automatic, bottle labeler.

Copper, steam jacketed kettles, with and without agitators.

3—40 gallon aluminum jacketed kettles.

Filler Filling Machine

National Mayonnaise Co., 20 gallon mayonnaise mixer.

PACKAGING AND CARTONING EQUIPMENT

Including cartoning units, filling and wrapping machines—all types, makes and sizes in stock.

WE PAY CASH FOR SINGLE MACHINES OR ENTIRE PLANTS

UNION STANDARD EQUIPMENT CO.
318 Lafayette Street
New York, 12, N. Y.

1—TOLHURST Extractor, 40" solid steel basket, bottom outlet, suspended type, 15 HP Motor.

1—Buffalo Evaporator No. 46.
2—Aluminum Jacketed Kettles, 50-gals.
1—Stainless Steel Kettle, Agitated, 500-gals.
1—Jacketed Stainless Steel Kettle, Agitated, 250-gals.
1—Jacketed Copper Kettle, 3750-gals.
4—VALLEZ 40-Leaf Rotary Filter Presses, 750 sq. ft.
2—W & P Jacketed Mixers, 2000-gals., 50 HP Motors & Speed Reducers.
2—W & P "Uni-Dor" Jacketed Mixers, 75-gals.
1—Devine Vacuum Shelf Dryer, 5 Shelves.
1—Devine Vacuum Shelf Dryer, 19 Shelves.
1—Buffalo Vacuum Shelf Dryer, 16 Shelves.
1—Bartlett & Snow Rotary Direct Heat, Brick-Lined Dryer, 8½' dia., 50' long.
1—Huhn Rotary Tube Dryer, 38" dia., 9' long, 84 one-inch steel tubes.
1—Stainless Steel Extractor & Washer, 36" x 18".

(Send for "GELB NEWS RECORD")
R. GELB & SONS, INC.
Union, N. J. UNionville 2-4900

F M C

COMPLETE NEW LIST NOW READY!
Send for Your Copy

OUTSTANDING ITEMS

15 New FMC Powder Mixers, 300 to 3000 lbs.
2 Single Basket Retorts
3 Copper Kettles (100 gal.)
4 Colloid Mills (var. cap.)
1 Day Imperial 150 gal. Mixer
12 Vacuum Pans, Stills; Copper, Nickel, Alum.
2 Gl. Lined 750 gal. Jktd. Tanks
6 Heavy Copper Tanks; 950 gal.
6 Jktd. Cookers, Agt. 1000 gal.
4 Big Digesters or Pressure Ves.
1 Buffalo Lab. Vac. Drum Dryer
1 HPM 24" Hydr. Fruit Press
1 Indiana Pulper, 18"x49"
1 Karl Kiefer Visco Filler

USUALLY IN FMC STOCK

Agitators
Blowers
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Labelers
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Mixers
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Water Stills
COMPLETE PLANTS

SELL FMC YOUR SURPLUS

FIRST MACHINERY CORP.
F M C
9th St. & EAST RIVER DRIVE
NEW YORK CITY

Here is CORROSION RESISTANT ALLOY VALVE DATA
that will help you Maintain Design and Production Schedules

● No matter how corrosive or abrasive your substance, there is a combination of alloys that *must* be used for efficient gate valve operation. To help you, this data is published in the interest of maintained production schedules and lower operation costs. It is available to design and maintenance engineers upon request.

General Guide to Materials for Various Services

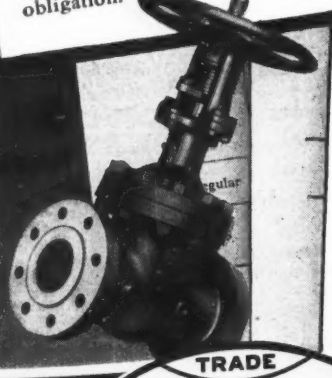
Service	Major Parts	Trim	Pipe and Tubing
Acetic Acid	Ni-Resist, Copper	Special Bronzes, Stainless Monel, High Nickel Chromium	Copper, Monel, Aluminum
Acetone	Brass, Copper	Special Bronzes, Stainless	Copper
Air	Iron, Steel, Brass	" "	Iron, Steel, Brass, Copper
Alcohol	Iron, Steel, Brass, Copper	" "	" " "
Ammonia	Iron, Steel, Ni-Resist, Brass, Bronze, Stainless, Monel	" " "	" " "
Aniline Dyes		Monel	" "
Beer		Stainless, Monel	
Brine			
Calcium Chloride			
Carbon Tetrachloride			
Carbonic Acid			
Calcium			

MATERIAL SPECIFICATIONS (METALS AND ALLOYS)

Darling Designation	Nearest A.S.T.M. Specifications	A.S.T.M. Specifications	Type or Name of Metal or Alloy	Form in Which Used	PHYSICAL PROPERTIES: Tensile Strength P.S.I.	Yield Point P.S.I.	Elong. in 2" %	Reduc. of Area %	Brinell Hardness	USES
Daraloy 437		B59-39 Grade A	Special Aluminum-Bronze	Castings	80,000	45,000	18		90	Valve stems, yoke stem nuts, disc facing, pressure castings, hydrant parts, seat rings, etc.
Al.		B26-37	Aluminum	Castings	20,000	7,000	5			Valve parts for certain corrosive services.
		B89-40		Bar Stock	35,000	9,000	16	40		Valve stems for certain corrosive services.
ular			Bolting Material, Regular	Headed Bolts or Studs	60,000	45,000	18	45		Ordinary service
		A96-39	Bolting Material,	Bolt Stud	125,000	105,000	16	50		High temperature and high pressure service.

For that CRITICAL INSTALLATION IN YOUR PLANT

To properly serve users of corrosion resistant valves, Darling Valve & Manufacturing Co. has developed a questionnaire to survey *all conditions* surrounding corrosion problems. Wire or write for your copy of this questionnaire. There is no obligation.



RATED SERVICE PRESSURES FOR ALLOY VALVES
WHEN MADE OVER IRON BODY, U-BOLT, BRONZE OR SPECIALLOY PATTERNS

USE OF CHART

Example—Assume that a 6-inch gate valve, made of Monel and suitable for 150 lbs. cold service pressure is needed. Monel is in Alloy Group C. Under 6-inch valves you find that a Group C valve to meet your needs can be obtained in the 125 lb. Steam, Iron Body pattern, the 150 lb. Steam, Bronze pattern, and the Specialloy pattern.
NOTE—Pressures shown in chart are the same for all sizes of valves in same shaded area.

ALLOY GROUP

A—Darvaliron, Darling 3, 146, and 180 Alloys.
B—Darling 137 Alloy Body and Bonnet, and 437 Alloy Discs.
C—Monel, Darling 96, 97, 302, 410 and 437 Alloys
D—Aluminum.

Pattern	Regular Rating	Page No.	Alloy Group	SIZE OF VALVE, in Inches: ¼	⅜	½	¾	1	1¼	1½	2	2½	3	4	5	6	8	10	12
				Alloy Rated Service Pressures in lbs. per sq. in. at 100° F.															
IRON BODY GATE VALVES	25 lb. Steam		A											50		50	50	50	50
			B											125		125	125	125	125
			C											125		125	125*	125*	125*
			D											40		40	40	—	—
	125 lb. Steam		A											150		150	150	150	150
			B											200		200	200	200	200
			C											200*		200*	200*	200*	200*
			D											100		100	100	—	—
	175 lb. O-W-G		A											175		175	175	175	175
			B											300		300	300	300	300
			C											300		300	300*	300*	300*
			D											100		100	100	—	—
	200 lb. O-W-G		A											200		200	200	200	200
			B											250		250	250	250	250

TRADE DARLING MARK

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ADVERTISERS IN THIS ISSUE

Alabama State Planning Board.....140
Allegheny-Ludlum Steel Corp. 159
● Allis-Chalmers Mfg. Co. 5, 9, 13, 28-29
Aluminum Cooking Utensil Co. ... 14
American Can Co. 66
American Coolair Corp. 116
American Rolling Mill Co. 141
American Gas Assoc. 169
American Lecithin Co. 122
American Pine & Construction Co..197
Ames Iron Works..... 123
● Anchor Hocking Glass Corp. 56-57
Arabol Mfg. Co. 168
● Armstrong Cork Co. 101, 102, 129
Artisan Metal Products, Inc. 107

Baker-Raulang Co. 144
Baldwin-Duckworth Div. Chain Belt Co. 24
Barnett Laboratories 112
Belden Brick Co. 180
Bemis Bros. Bag Co. 25
Betner Co., Benj. C. 183
● Blickman, Inc., S. 126
Brill Equipment Co. 207
Brown Instrument Co. 8
Buell Engineering Co. 17
● Buffalo Forge Co. 65
Buffalo Wire Works Co. 146
Buma Pump Co. 114
Burkhard, Inc., Thomas..... 205
Byron Jackson Co. 58

Can Manufacturers' Institute, Inc. 34-35
Century Electric Co. 55
Chain Belt Co. 60
Cherry-Burrell Corp. 130
Chisholm-Ryder Co., Inc. 188
Cleaver-Brooks Co. 36
Consolidated Products Co., Inc. ...205
Consolidated Siphon Supply Co., Inc. 172
Container Corp. 12
Continental Can Co. 119
● Corning Glass Works..... 22
Corn Products Sales Co. 165
● Crane Co. 48
● Crocker-Wheeler Electric Mfg. Co. 138
Crown Can Company..... 150
Crown Cork & Seal Co. 41
● Cyclone Fence Co. 182

Darling Valve & Mfg. Co. 208
Darnell Corp., Ltd. 153
Dayton Rubber Co. 19
Dehydrated Foods Co. 206
Dewey & Almy Chemical Co. 156
Dexter Folder Co. 184
Diamond Crystal Salt Co. 143
Distillation Products, Inc. 161-175
Diversey Corporation 111
● Dobeckmun Co., Inc. 31
● Dodge & Alcott Co. 175
● Dole Refrigerating Co. 146
● Dow Chemical Co. 27, 174
du Pont de Nemours & Co., Inc., E. I. 20

Easter Food Products..... 205
Federal Telephone & Radio Corp...167
Felton Chemical Co. 198
First Machinery Corp. 207
● Florasynth Laboratories, Inc. 200
Food Research Laboratories..... 112
Foster-Forbes Glass Co. 61
Foxboro Co. 52
Fredrick Iron & Steel Co. 132
Fritsche Bros., Inc. 160

Gair Co., Inc., Robt. 37
● Gardner-Richardson Co. 51
Gaylord Container Corp. ..Third Cover
Gelb & Son, Inc., R. 207
General American Process Equipment 120
● General Electric Co. 33, 190-191
General Mills, Inc. 164
Globe Stainless Tube..... 53
Globe Woven Belting Co. 113
Goat Co., Inc., Fred..... 193
Glycerine Producers Association....173
Graham Mfg. Co., Inc. 185
Gruendler Crusher Co. 200
● Gums Co., B. F. 118
Gutmann & Co., Ferdinand..... 192

Hamilton Brass & Copper Works...192
● Hoffman-La Roche, Inc. 104
Howell Electric Motors Co. 50
● Howes Co., Inc., S. 175
● Huron Milling Co. 166

Illinois Electric Porcelain Co. 63
Ingersoll-Rand Co. 26
Ingersoll Steel & Disc Div., Borg Warner Corp. 187
Inland Steel Container Co. 195
Ivanhoe Foods, Inc. 166

Jenkins Bros. 6
Johns-Manville Corp. 192

Kehoe Machinery Corp., Lester....205
Kinetic Chemical, Inc. 181
Koven & Bros., Inc., L. O. 202
Krimo Ko Comp..... 116

Lamson Corp. 128
LaPorte Mat. & Mfg. Co. 180
Leberco Labs..... 122
● Lee Metal Products Co., Inc. 184
● Leeds & Northrup Co. 30
● Link-Belt Co. 4, 7
Liquidometer Corp. 184
Loeb Equipment Supply Co. 205
Lunkenheimer Co. 136

Machinery & Equipment Corp. (New York City)..... 207
Machinery & Equipment Co. (San Francisco) 205
● Magnus, Mabee & Reynard, Inc. ..170
Marathon Corporation 15
Marco Co., Inc. 210
Master Electric Co. 23
● Mathieson Alkali Works..... 117
Merck & Co., Inc. 158
Mercer-Robinson Co. 154
● Merco'd Corp. 168
Metal Glass Products Co. 109
Meyercord Co. 145
Milprint, Inc. 54
● Monsanto Chemical Co. 119, 127

● Nash Engineering Co. 99
National Can Corp. 176-177
National Starch Products Co. 142
Neuberg Co., William D. 166
New England Vinegar Works..... 166
Niagara Blower Co. 198
Nordberg Mfg. Co. 206
Nutritional Research Assoc., Inc.... 166

● Oakite Products, Inc. 115
Orr & Sembower, Inc. 196
Owens-Illinois Glass Co. 201

Package Machinery Co. 137
Pack-rite Machine Co. 196
Paisley Products, Inc. 179
Penick & Co., S. B. 112
Perry Equipment & Supply Co. 207
● Pfaudler Co. 11
● Pfizer & Co., Inc., Chas. 162
Philadelphia Quartz Co. 134
● Pneumatic Scale Corp., Ltd. 186
● Porter Co., Inc., H. M. ..Second Cover
Powell Co., William..... 16
Powers Regulator Co. 206
Pressed Steel Tank Co. 135
● Pulverizing Machinery Co. 170

Quaker City Cold Storage Co. 206

Republic Steel Corp. 46-47
Rhinelander Paper Co. 59
Rienel Paper Corp. 45
Robbins & Myers, Inc. 147
Roper Corp., Geo. D. 202
Ross & Rowe, Inc. 122
Ryerson & Son, R. T. 21

St. Regis Paper Co. 171
Salem Engineering Co. 182
● Sarco Company 188
Savage Bros. Co..... 206
Seedburo Equipment Co. 148
Seiberling Latex Products Co. 202
Shellmar Products Co. 163
Sparkler Mfg. Co. 180
Stalev Co. 43
Standard Conveyor Corp. 125
Stecher-Traung Lithograph Corp...198
Stein, Hall & Co., Inc. 166
● Stephens-Adamson Mfg. Co. 10
Stokes Machine Co., F. J...168, 172, 200
Stokes & Smith Co. 172
Sutton, Steele & Steele, Inc. 103
● Swenson Evaporator Co., Div. of Whiting Corp. 178
Sylvania Industrial Corp. 64

Tanglefoot Co. 182
Tarbonis Company 132
Tasty Baking Co. 206
Taylor Instrument Co. 42
Texas Co. ..... Back Cover
Timken Roller Bearing Co. 62
Trailer Company of America..... 189
Tri-Clover Machinery 124
Turco Products, Inc. 194
Twitchell, Inc., E. W. 134

Union Iron Works..... 149
Union Special Machine Co. 203
Union Standard Equipment Co. 207
U. S. Steel Corp. 18

Viking Pump Co. 148
Vilter Mfg. Co. 133
Viobin Corp. 166
● Vitamins, Inc. 166

Wallace & Tiernan Company, Inc...209
Walworth Co. 32
● Westinghouse Elec. & Mfg. Co. ..38-39
Wickwire Spencer Steel Co. 40
● Winthrop Chemical Co. 188
Wood's, T. B., Sons Co. 44
Wyandotte Chemical Corp. 155

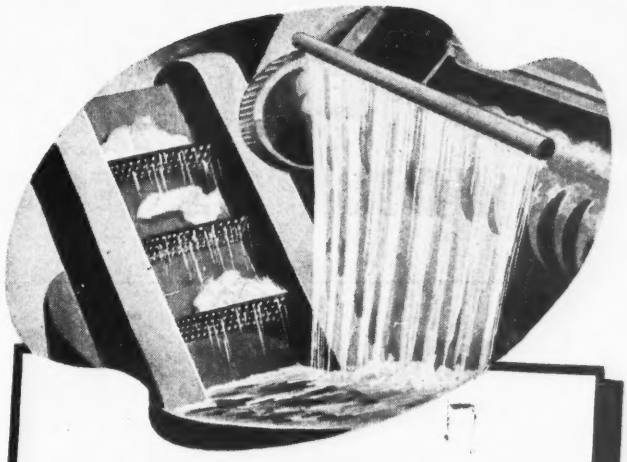
● Yale & Towne Mfg. Co., Krpn Scale Div. 199
Young Radiator Co. 196

● For further detailed information regarding this company's products see the 1944 FOOD INDUSTRIES CATALOGS & DIRECTORY

Materials for the Food Manufacturer—166
Professional Services—206
Storage, Frozen Foods—206
SEARCHLIGHT SECTION

Classified Advertising

BUSINESS OPPORTUNITIES.....204
EMPLOYMENT 204, 205
USED EQUIPMENT 205, 207
WANTED TO PURCHASE.....206



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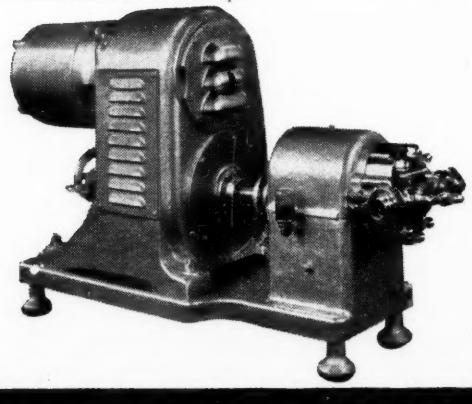

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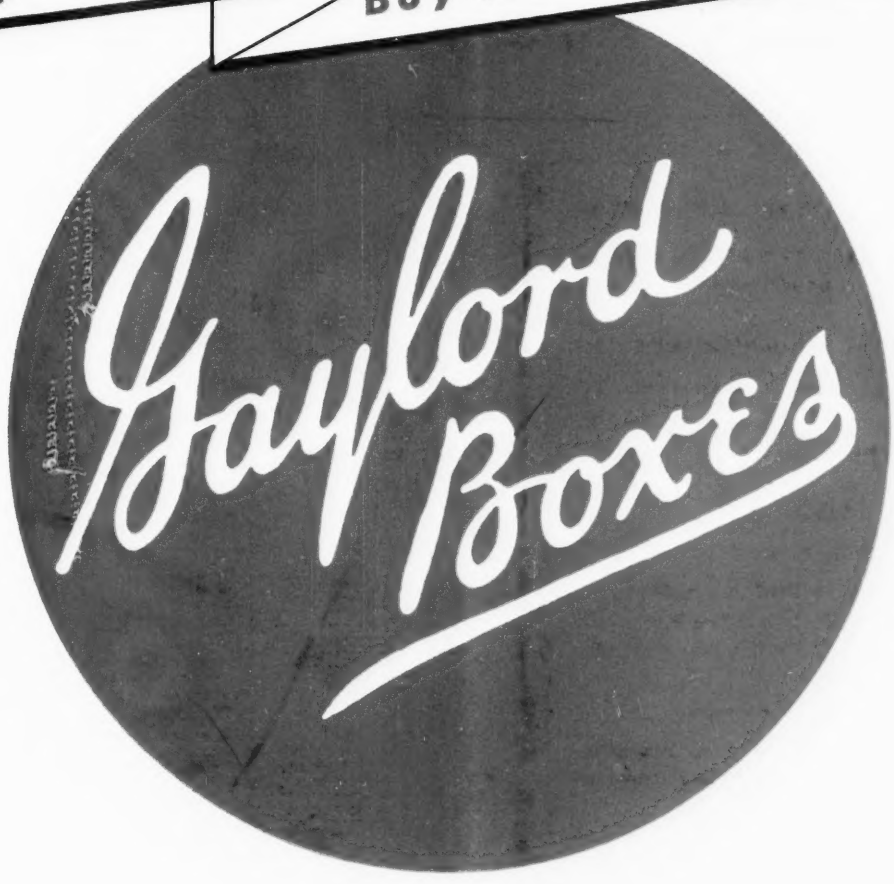

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